

รายการอ้างอิง

ภาษาไทย

ไมตรี สุทธิจิตต์. สารพิษรอบตัวเรา สาเหตุ กลไกการเกิดพิษและการป้องกัน.

ภาควิชาชีวเคมี คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่ , 2531.

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ประกอบการบรรยายเรื่อง ระบบบำบัดน้ำเสียสำหรับอุตสาหกรรม การใช้และ

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ภาคผนวก

รูปแบบแสดงข้อมูลในตารางผลการทดลอง ขั้นตอนการกำจัดโลหะหนัก

SAMPLE	Volume(ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr6+}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
No.									
1	2	3	4	5	6	7	8	9	10

1. SAMPLE No. แสดงลำดับการเก็บน้ำตัวอย่างที่ผ่านคอลัมน์ทดลอง
2. Volume (ml.) แสดงปริมาตรน้ำเสียใดๆ ที่ผ่านคอลัมน์ทดลองที่ทำการเก็บตัวอย่าง มีหน่วยเป็น มล.
3. pH แสดงค่า pH ที่ผ่านคอลัมน์ทดลองที่ปริมาตรน้ำเสียซึ่งทำการเก็บตัวอย่าง
4. ORP (mV.) แสดงค่า Oxidation-Reduction Potential ที่ผ่านคอลัมน์ทดลองที่ ปริมาตรน้ำเสียซึ่งทำการเก็บตัวอย่าง
5. % T_{Total} แสดงค่าการดูดกลืนแสงของสีที่เกิดขึ้นจากปฏิกิริยาของโครเมียมทั้งหมด และไดฟีนิลคาร์บาไซด์
6. % T_{Cr6+} แสดงค่าการดูดกลืนแสงของสีที่เกิดขึ้นจากปฏิกิริยาของโครเมียม (ประจุ+6) และไดฟีนิลคาร์บาไซด์
7. Cr⁶⁺(mg.) แสดงค่าโครเมียม (ประจุ+6) ที่ผ่านคอลัมน์ทดลองที่ปริมาตรน้ำเสียซึ่ง ทำการเก็บตัวอย่าง

$$\text{Cr}^{6+}(\text{mg.}) = \frac{\text{ไมโครกรัมโครเมียมที่อ่านจากกราฟ}}{1,000}$$
8. Cr³⁺(mg.) แสดงค่าโครเมียม (ประจุ+3) ที่ผ่านคอลัมน์ทดลองที่ปริมาตรน้ำเสียซึ่ง ทำการเก็บตัวอย่าง
9. Cr⁶⁺(mg./l.) แสดงค่าความเข้มข้นของโครเมียม (ประจุ+6) ที่ออกจากคอลัมน์ทดลอง ที่ปริมาตรน้ำเสียซึ่งทำการเก็บตัวอย่าง มีหน่วยเป็น มก./ล.

$$\text{Cr}^{6+}(\text{mg./l.}) = \frac{\text{ไมโครกรัมโครเมียมที่อ่านจากกราฟ}}{\text{ปริมาตรตัวอย่าง(มล.)}}$$
10. Cr³⁺(mg./l.) แสดงค่าความเข้มข้นของโครเมียม (ประจุ+3) ที่ออกจากคอลัมน์ทดลอง ที่ปริมาตรน้ำเสียซึ่งทำการเก็บตัวอย่าง มีหน่วยเป็น มก./ล.

$$\text{Cr}^{3+}(\text{mg./l.}) = \text{Cr}_{\text{Total}}(\text{mg./l.}) - \text{Cr}^{6+}(\text{mg./l.})$$

รูปแบบแสดงข้อมูลในตารางผลการทดลอง ขั้นตอนการฟื้นน้ำจืดกลาง

SAMPLE	Volume (ml.)	pH	ORP (mV.)	%T _{Total}	%T _{Cr6+}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
No.									
1	2	3	4	5	6	7	8	9	10

- SAMPLE No. แสดงลำดับการเก็บน้ำตัวอย่างที่ผ่านคอลัมน์ทดลอง
- Volume (ml.) แสดงปริมาตรสารรีเจนเนอเรนต์ที่ใช้ในการฟื้นน้ำจืดกลาง มีหน่วยเป็น มล.
- pH แสดงค่า pH ที่ผ่านคอลัมน์ทดลองที่ปริมาตรสารรีเจนเนอเรนต์ ซึ่งทำการเก็บตัวอย่าง
- ORP (mV.) แสดงค่า Oxidation-Reduction Potential ที่ผ่านคอลัมน์ทดลองที่ปริมาตรสารรีเจนเนอเรนต์ซึ่งทำการเก็บตัวอย่าง
- % T_{Total} แสดงค่าการดูดกลืนแสงของสีที่เกิดขึ้นจากปฏิกิริยาของโครเมียมทั้งหมดและไดฟีนิลคาร์บาไซด์
- % T_{Cr6+} แสดงค่าการดูดกลืนแสงของสีที่เกิดขึ้นจากปฏิกิริยาของโครเมียม (ประจุ+6) และไดฟีนิลคาร์บาไซด์
- Cr⁶⁺(mg.) แสดงค่าโครเมียม (ประจุ+6) ที่ผ่านคอลัมน์ทดลองที่ปริมาตรสารรีเจนเนอเรนต์ ซึ่งทำการเก็บตัวอย่าง

$$\text{Cr}^{6+}(\text{mg.}) = \frac{\text{ไมโครกรัมโครเมียมที่อ่านจากกราฟ}}{1,000}$$
- Cr³⁺(mg.) แสดงค่าโครเมียม (ประจุ+3) ที่ผ่านคอลัมน์ทดลองที่ปริมาตรสารรีเจนเนอเรนต์ ซึ่งทำการเก็บตัวอย่าง
- Cr⁶⁺(mg./l.) แสดงค่าความเข้มข้นของโครเมียม (ประจุ+6) ที่ออกจากคอลัมน์ทดลองที่ปริมาตรสารรีเจนเนอเรนต์ซึ่งทำการเก็บตัวอย่าง มีหน่วยเป็น มก./ล.

$$\text{Cr}^{6+}(\text{mg./l.}) = \frac{\text{ไมโครกรัมโครเมียมที่อ่านจากกราฟ}}{\text{ปริมาตรตัวอย่าง(มล.)}}$$
- Cr³⁺(mg./l.) แสดงค่าความเข้มข้นของโครเมียม (ประจุ+3) ที่ออกจากคอลัมน์ทดลองที่ปริมาตรสารรีเจนเนอเรนต์ซึ่งทำการเก็บตัวอย่าง มีหน่วยเป็น มก./ล.

$$\text{Cr}^{3+}(\text{mg./l.}) = \text{Cr}_{\text{Total}}(\text{mg./l.}) - \text{Cr}^{6+}(\text{mg./l.})$$

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.56	100.05	91.20	91.20	0.00019	0.00000	0.0097	0.0000
2	20	4.58	98.89	91.20	91.20	0.00019	0.00000	0.0097	0.0000
3	20	4.62	96.56	91.20	91.20	0.00019	0.00000	0.0097	0.0000
4	20	4.71	91.32	91.00	91.10	0.00039	0.00019	0.0194	0.0097
5	20	4.76	88.41	91.00	91.20	0.00019	0.00039	0.0097	0.0194
6	20	4.77	87.82	91.00	91.10	0.00039	0.00019	0.0194	0.0097
7	20	4.80	86.08	90.90	91.00	0.00058	0.00019	0.0292	0.0097
8	20	4.83	84.33	90.90	91.00	0.00058	0.00019	0.0292	0.0097
9	20	4.84	83.75	90.80	90.90	0.00078	0.00019	0.0389	0.0097
10	20	4.86	82.58	90.60	90.90	0.00078	0.00058	0.0389	0.0292
11	20	4.88	81.42	90.80	90.90	0.00078	0.00019	0.0389	0.0097
12	20	4.92	79.09	90.90	91.00	0.00058	0.00019	0.0292	0.0097
13	20	4.90	80.25	90.60	90.90	0.00078	0.00058	0.0389	0.0292
14	20	4.81	85.49	90.50	90.70	0.00117	0.00039	0.0583	0.0194
15	20	4.73	90.15	90.60	90.90	0.00078	0.00058	0.0389	0.0292
16	20	4.65	94.81	90.60	90.80	0.00097	0.00039	0.0486	0.0194
17	20	4.60	97.72	90.60	90.90	0.00078	0.00058	0.0389	0.0292
18	20	4.59	98.31	90.50	90.90	0.00078	0.00078	0.0389	0.0389
19	20	4.57	99.47	90.60	90.80	0.00097	0.00039	0.0486	0.0194
20	20	4.55	100.64	90.80	90.90	0.00078	0.00019	0.0389	0.0097
21	20	4.64	95.39	90.70	90.90	0.00078	0.00039	0.0389	0.0194
22	20	4.67	93.65	90.60	90.90	0.00078	0.00058	0.0389	0.0292
23	20	4.71	91.32	90.60	90.80	0.00097	0.00039	0.0486	0.0194
24	20	4.80	86.08	90.50	90.80	0.00097	0.00058	0.0486	0.0292
25	20	4.73	90.15	90.30	90.80	0.00097	0.00097	0.0486	0.0486
26	20	4.76	88.41	90.40	90.90	0.00078	0.00097	0.0389	0.0486
27	20	4.81	85.49	90.40	90.80	0.00097	0.00078	0.0486	0.0389
28	20	4.84	83.75	90.20	90.50	0.00156	0.00058	0.0778	0.0292
29	20	4.86	82.58	90.00	90.90	0.00078	0.00175	0.0389	0.0875

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
30	20	4.89	80.84	90.10	90.60	0.00136	0.00097	0.0681	0.0486
31	20	4.94	77.92	89.90	90.90	0.00078	0.00194	0.0389	0.0972
32	20	5.02	73.27	89.80	90.80	0.00097	0.00194	0.0486	0.0972
33	20	5.09	69.19	90.00	90.70	0.00117	0.00136	0.0583	0.0681
34	20	5.14	66.28	89.80	90.90	0.00078	0.00214	0.0389	0.1069
35	20	5.21	62.20	89.60	90.80	0.00097	0.00233	0.0486	0.1167
36	20	5.24	60.45	89.60	90.90	0.00078	0.00253	0.0389	0.1264
37	20	5.26	59.29	89.90	90.90	0.00078	0.00194	0.0389	0.0972
38	20	5.27	58.71	89.60	90.80	0.00097	0.00233	0.0486	0.1167
39	20	5.30	56.96	90.00	90.80	0.00097	0.00156	0.0486	0.0778
40	20	5.37	52.88	90.10	90.70	0.00117	0.00117	0.0583	0.0583
41	20	5.29	57.54	89.80	90.80	0.00097	0.00194	0.0486	0.0972
42	20	5.14	66.28	89.90	90.60	0.00136	0.00136	0.0681	0.0681
43	20	5.20	62.78	90.00	90.90	0.00078	0.00175	0.0389	0.0875
44	20	5.22	61.62	90.00	90.80	0.00097	0.00156	0.0486	0.0778
45	20	5.24	60.45	89.70	90.90	0.00078	0.00233	0.0389	0.1167
46	20	5.19	63.37	89.90	90.80	0.00097	0.00175	0.0486	0.0875
47	20	5.22	61.62	89.80	90.70	0.00117	0.00175	0.0583	0.0875
48	20	5.27	58.71	89.90	90.80	0.00097	0.00175	0.0486	0.0875
49	20	5.36	53.47	89.90	90.70	0.00117	0.00156	0.0583	0.0778
50	20	5.32	55.79	89.60	90.60	0.00136	0.00194	0.0681	0.0972
51	20	5.28	58.12	89.70	90.90	0.00078	0.00233	0.0389	0.1167
52	20	5.25	59.87	89.60	90.70	0.00117	0.00214	0.0583	0.1069
53	20	5.21	62.20	89.80	90.80	0.00097	0.00194	0.0486	0.0972
54	20	5.23	61.04	90.10	90.70	0.00117	0.00117	0.0583	0.0583
55	20	5.41	50.55	89.80	90.70	0.00117	0.00175	0.0583	0.0875
56	20	5.37	52.88	89.90	90.60	0.00136	0.00136	0.0681	0.0681
57	20	5.34	54.63	89.80	90.50	0.00156	0.00136	0.0778	0.0681
58	20	5.28	58.12	89.70	90.70	0.00117	0.00194	0.0583	0.0972
59	20	5.16	65.11	89.70	90.60	0.00136	0.00175	0.0681	0.0875

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.02	131.50	87.90	88.70	0.0051	0.0016	0.2528	0.0778
2	20	4.05	129.75	87.70	88.80	0.0049	0.0021	0.2430	0.1069
3	20	4.07	128.59	87.50	88.80	0.0049	0.0025	0.2430	0.1264
4	20	4.09	127.42	87.70	88.90	0.0047	0.0023	0.2333	0.1167
5	20	4.10	126.84	87.60	88.90	0.0047	0.0025	0.2333	0.1264
6	20	4.14	124.51	88.00	89.00	0.0045	0.0019	0.2236	0.0972
7	20	4.16	123.35	88.10	89.10	0.0043	0.0019	0.2139	0.0972
8	20	4.18	122.18	88.20	89.10	0.0043	0.0017	0.2139	0.0875
9	20	4.23	119.27	88.30	89.20	0.0041	0.0017	0.2042	0.0875
10	20	4.34	112.87	88.30	89.30	0.0039	0.0019	0.1944	0.0972
11	20	4.49	104.13	88.50	89.30	0.0039	0.0016	0.1944	0.0778
12	20	4.55	100.64	88.60	89.40	0.0037	0.0016	0.1847	0.0778
13	20	4.57	99.47	88.60	89.50	0.0035	0.0017	0.1750	0.0875
14	20	4.69	92.48	88.70	89.60	0.0033	0.0017	0.1653	0.0875
15	20	4.73	90.15	88.70	89.60	0.0033	0.0017	0.1653	0.0875
16	20	4.80	86.08	88.70	89.70	0.0031	0.0019	0.1556	0.0972
17	20	4.85	83.17	88.80	89.90	0.0027	0.0021	0.1361	0.1069
18	20	4.86	82.58	88.90	90.10	0.0023	0.0023	0.1167	0.1167
19	20	4.89	80.84	89.00	90.20	0.0021	0.0023	0.1069	0.1167
20	20	4.93	78.51	89.00	90.30	0.0019	0.0025	0.0972	0.1264
21	20	5.09	69.19	89.10	90.30	0.0019	0.0023	0.0972	0.1167
22	20	5.10	68.61	89.20	90.40	0.0017	0.0023	0.0875	0.1167
23	20	5.12	67.44	89.50	90.60	0.0014	0.0021	0.0681	0.1069
24	20	5.28	58.12	89.50	90.70	0.0012	0.0023	0.0583	0.1167
25	20	5.30	56.96	89.60	90.70	0.0012	0.0021	0.0583	0.1069
26	20	5.33	55.21	89.70	90.70	0.0012	0.0019	0.0583	0.0972
27	20	5.39	51.72	90.10	90.80	0.0010	0.0014	0.0486	0.0681
28	20	5.39	51.72	90.50	90.80	0.0010	0.0006	0.0486	0.0292

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (1 st REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
29	20	5.38	52.30	90.40	90.90	0.0008	0.0010	0.0389	0.0486
30	20	5.43	49.39	90.70	90.90	0.0008	0.0004	0.0389	0.0194
31	20	5.48	46.48	90.80	91.00	0.0006	0.0004	0.0292	0.0194
32	20	5.47	47.06	90.90	91.00	0.0006	0.0002	0.0292	0.0097
33	20	5.48	46.52	91.00	91.10	0.0004	0.0002	0.0194	0.0097
34	20	5.51	44.73	91.00	91.10	0.0004	0.0002	0.0194	0.0097
35	20	5.54	42.98	91.10	91.20	0.0002	0.0002	0.0097	0.0097
36	20	5.55	42.40	91.20	91.20	0.0002	0.0000	0.0097	0.0000
37	20	5.52	44.15	91.20	91.20	0.0002	0.0000	0.0097	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (2 nd RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.18	63.95	90.20	90.20	0.00214	0.00000	0.1069	0.0000
2	20	5.25	59.87	90.20	91.20	0.00019	0.00194	0.0097	0.0972
3	20	5.30	56.96	91.20	91.20	0.00019	0.00000	0.0097	0.0000
4	20	5.31	56.38	91.10	91.20	0.00019	0.00019	0.0097	0.0097
5	20	5.35	54.05	91.00	91.10	0.00039	0.00019	0.0194	0.0097
6	20	5.36	53.47	90.90	91.00	0.00058	0.00019	0.0292	0.0097
7	20	5.47	47.06	90.80	90.90	0.00078	0.00019	0.0389	0.0097
8	20	5.59	40.07	90.70	90.80	0.00097	0.00019	0.0486	0.0097
9	20	5.72	32.50	90.60	90.90	0.00078	0.00058	0.0389	0.0292
10	20	5.70	33.66	90.60	90.90	0.00078	0.00058	0.0389	0.0292
11	20	5.76	30.17	90.70	90.90	0.00078	0.00039	0.0389	0.0194
12	20	5.81	27.26	90.90	91.00	0.00058	0.00019	0.0292	0.0097
13	20	5.85	24.93	90.80	90.90	0.00078	0.00019	0.0389	0.0097
14	20	5.91	21.44	90.60	90.80	0.00097	0.00039	0.0486	0.0194
15	20	5.90	22.02	90.60	90.70	0.00117	0.00019	0.0583	0.0097
16	20	5.89	22.60	90.70	90.80	0.00097	0.00019	0.0486	0.0097
17	20	5.86	24.35	90.50	90.90	0.00078	0.00078	0.0389	0.0389
18	20	5.87	23.76	90.80	90.90	0.00078	0.00019	0.0389	0.0097
19	20	5.84	25.51	90.80	90.90	0.00078	0.00019	0.0389	0.0097
20	20	5.81	27.26	90.60	90.70	0.00117	0.00019	0.0583	0.0097
21	20	5.79	28.42	90.80	90.90	0.00078	0.00019	0.0389	0.0097
22	20	5.77	29.59	90.60	90.80	0.00097	0.00039	0.0486	0.0194
23	20	5.76	30.17	90.40	90.80	0.00097	0.00078	0.0486	0.0389
24	20	5.68	34.83	90.80	91.00	0.00058	0.00039	0.0292	0.0194
25	20	5.71	33.08	90.70	90.90	0.00078	0.00039	0.0389	0.0194
26	20	5.69	34.25	90.70	90.90	0.00078	0.00039	0.0389	0.0194
27	20	5.65	36.58	90.70	90.80	0.00097	0.00019	0.0486	0.0097
28	20	5.63	37.74	90.60	90.90	0.00078	0.00058	0.0389	0.0292
29	20	5.62	38.32	90.80	90.90	0.00078	0.00019	0.0389	0.0097
30	20	5.55	42.40	90.70	91.00	0.00058	0.00058	0.0292	0.0292

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (2 nd RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
31	20	5.49	45.89	90.70	90.90	0.00078	0.00039	0.0389	0.0194
32	20	5.57	41.24	90.50	90.80	0.00097	0.00058	0.0486	0.0292
33	20	5.58	40.65	90.60	90.80	0.00097	0.00039	0.0486	0.0194
34	20	5.64	37.16	90.70	90.90	0.00078	0.00039	0.0389	0.0194
35	20	5.67	35.41	89.70	90.80	0.00097	0.00214	0.0486	0.1069
36	20	5.67	35.41	90.10	90.70	0.00117	0.00117	0.0583	0.0583
37	20	5.69	34.25	90.30	90.80	0.00097	0.00097	0.0486	0.0486
38	20	5.71	33.08	90.70	90.80	0.00097	0.00019	0.0486	0.0097
39	20	5.84	25.51	90.70	90.80	0.00097	0.00019	0.0486	0.0097
40	20	6.02	15.03	90.50	90.70	0.00117	0.00039	0.0583	0.0194
41	20	5.92	20.85	90.20	90.60	0.00136	0.00078	0.0681	0.0389
42	20	5.88	23.18	90.10	90.60	0.00136	0.00097	0.0681	0.0486
43	20	5.81	27.26	90.10	90.50	0.00156	0.00078	0.0778	0.0389
44	20	5.77	29.59	90.00	90.40	0.00175	0.00078	0.0875	0.0389
45	20	5.75	30.75	90.20	90.50	0.00156	0.00058	0.0778	0.0292
46	20	5.71	33.08	90.30	90.50	0.00156	0.00039	0.0778	0.0194
47	20	5.64	37.16	90.10	90.30	0.00194	0.00039	0.0972	0.0194
48	20	5.60	39.49	90.00	90.10	0.00233	0.00019	0.1167	0.0097
49	20	5.58	40.65	89.80	90.00	0.00253	0.00039	0.1264	0.0194
50	20	5.57	41.24	89.90	90.30	0.00194	0.00078	0.0972	0.0389
51	20	5.50	45.31	89.80	90.30	0.00194	0.00097	0.0972	0.0486
52	20	5.44	48.81	89.60	90.20	0.00214	0.00117	0.1069	0.0583
53	20	5.42	49.97	89.50	90.00	0.00253	0.00097	0.1264	0.0486
54	20	5.42	49.95	89.50	90.30	0.00194	0.00156	0.0972	0.0778
55	20	5.37	52.88	89.20	89.80	0.00292	0.00117	0.1458	0.0583
56	20	5.36	53.47	89.10	89.80	0.00292	0.00136	0.1458	0.0681
57	20	5.35	54.05	89.20	89.70	0.00311	0.00097	0.1556	0.0486
58	20	5.34	54.63	89.00	89.40	0.00369	0.00078	0.1847	0.0389
59	20	5.35	54.00	89.00	89.60	0.00331	0.00117	0.1653	0.0583
60	20	5.30	56.96	89.00	89.50	0.00350	0.00097	0.1750	0.0486

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (2 nd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.10	126.84	88.10	88.60	0.0262	0.0049	0.2625	0.0486
2	100	4.24	118.69	88.40	88.70	0.0253	0.0029	0.2528	0.0292
3	100	4.31	114.61	88.60	90.40	0.0087	0.0175	0.0875	0.1750
4	100	4.44	107.04	88.90	90.70	0.0058	0.0175	0.0583	0.1750
5	100	4.62	96.56	90.20	90.90	0.0039	0.0068	0.0389	0.0681
6	100	4.79	86.66	90.50	90.90	0.0039	0.0039	0.0389	0.0389
7	100	4.92	79.09	90.70	91.00	0.0029	0.0029	0.0292	0.0292
8	100	5.15	65.69	90.90	91.00	0.0029	0.0010	0.0292	0.0097
9	100	5.27	58.71	91.00	91.10	0.0019	0.0010	0.0194	0.0097
10	100	5.36	53.47	91.20	91.20	0.0010	0.0000	0.0097	0.0000
11	20	5.43	49.39	91.20	91.20	0.0002	0.0000	0.0097	0.0000
12	20	5.48	46.48	91.30	91.30	0.0000	0.0000	0.0000	0.0000
13	20	5.50	45.31	91.30	91.30	0.0000	0.0000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (3 rd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.22	119.85	79.10	82.50	0.0856	0.0331	0.8555	0.3305
2	100	4.31	114.61	81.80	85.10	0.0603	0.0321	0.6028	0.3208
3	100	4.46	105.88	85.20	87.60	0.0360	0.0233	0.3597	0.2333
4	100	4.52	102.38	84.90	88.30	0.0292	0.0331	0.2917	0.3305
5	100	4.72	90.74	86.70	89.40	0.0185	0.0262	0.1847	0.2625
6	100	4.75	88.99	89.40	90.20	0.0107	0.0078	0.1069	0.0778
7	100	4.89	80.84	90.00	90.50	0.0078	0.0049	0.0778	0.0486
8	100	4.93	78.51	90.50	90.80	0.0049	0.0029	0.0486	0.0292
9	100	4.94	77.92	90.70	90.90	0.0039	0.0019	0.0389	0.0194
10	100	4.99	75.01	90.90	91.00	0.0029	0.0010	0.0292	0.0097
11	100	5.01	73.85	90.90	91.00	0.0029	0.0010	0.0292	0.0097
12	100	5.04	72.10	90.90	91.10	0.0019	0.0019	0.0194	0.0194
13	100	5.07	70.35	91.10	91.20	0.0010	0.0010	0.0097	0.0097
14	20	5.11	68.02	91.20	91.20	0.0002	0.0000	0.0097	0.0000
15	20	5.13	66.86	91.20	91.20	0.0002	0.0000	0.0097	0.0000
16	20	5.14	66.28	91.20	91.20	0.0002	0.0000	0.0097	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 4 : (4 th REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.08	128.01	86.50	88.60	0.0262	0.0204	0.2625	0.2042
2	100	4.13	125.10	87.90	88.80	0.0243	0.0087	0.2430	0.0875
3	100	4.15	123.93	88.70	89.10	0.0214	0.0039	0.2139	0.0389
4	100	4.24	118.69	89.10	89.50	0.0175	0.0039	0.1750	0.0389
5	100	4.27	116.94	89.50	89.80	0.0146	0.0029	0.1458	0.0292
6	100	4.33	113.45	89.60	90.30	0.0097	0.0068	0.0972	0.0681
7	100	4.36	111.70	90.30	90.70	0.0058	0.0039	0.0583	0.0389
8	100	4.39	109.95	90.90	91.20	0.0010	0.0029	0.0097	0.0292
9	20	4.44	107.04	91.10	91.20	0.0002	0.0002	0.0097	0.0097
10	20	4.47	105.30	91.10	91.20	0.0002	0.0002	0.0097	0.0097
11	20	4.49	104.13	91.20	91.30	0.0000	0.0002	0.0000	0.0097
12	20	4.52	102.38	91.30	91.30	0.0000	0.0000	0.0000	0.0000



SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.24	60.45	91.30	91.30	0.00000	0.00000	0.0000	0.0000
2	20	5.21	62.20	91.30	91.30	0.00000	0.00000	0.0000	0.0000
3	20	5.17	64.53	91.20	91.20	0.00019	0.00000	0.0097	0.0000
4	20	5.08	69.77	91.10	91.20	0.00019	0.00019	0.0097	0.0097
5	20	5.03	72.68	91.00	91.10	0.00039	0.00019	0.0194	0.0097
6	20	4.98	75.59	90.80	90.90	0.00078	0.00019	0.0389	0.0097
7	20	4.91	79.67	90.90	91.10	0.00039	0.00039	0.0194	0.0194
8	20	4.82	84.91	91.00	91.10	0.00039	0.00019	0.0194	0.0097
9	20	4.74	89.57	90.90	91.00	0.00058	0.00019	0.0292	0.0097
10	20	4.66	94.23	90.80	91.00	0.00058	0.00039	0.0292	0.0194
11	20	4.60	97.72	90.90	90.90	0.00078	0.00000	0.0389	0.0000
12	20	4.50	103.55	90.90	91.00	0.00058	0.00019	0.0292	0.0097
13	20	4.73	90.15	90.90	91.00	0.00058	0.00019	0.0292	0.0097
14	20	4.81	85.49	90.90	91.10	0.00039	0.00039	0.0194	0.0194
15	20	5.02	73.27	90.80	90.90	0.00078	0.00019	0.0389	0.0097
16	20	5.29	57.54	90.90	91.00	0.00058	0.00019	0.0292	0.0097
17	20	5.34	54.63	91.00	91.00	0.00058	0.00000	0.0292	0.0000
18	20	5.42	49.97	90.90	90.90	0.00078	0.00000	0.0389	0.0000
19	20	5.40	51.14	90.80	90.90	0.00078	0.00019	0.0389	0.0097
20	20	5.43	49.39	90.60	90.80	0.00097	0.00039	0.0486	0.0194
21	20	5.60	39.49	90.60	90.90	0.00078	0.00058	0.0389	0.0292
22	20	5.46	47.64	90.90	91.00	0.00058	0.00019	0.0292	0.0097
23	20	5.39	51.72	90.80	90.90	0.00078	0.00019	0.0389	0.0097
24	20	5.35	54.05	90.80	90.80	0.00097	0.00000	0.0486	0.0000
25	20	5.41	50.55	90.60	90.70	0.00117	0.00019	0.0583	0.0097
26	20	5.48	46.48	90.50	90.70	0.00117	0.00039	0.0583	0.0194
27	20	5.46	47.64	90.50	90.60	0.00136	0.00019	0.0681	0.0097
28	20	5.45	48.22	90.30	90.70	0.00117	0.00078	0.0583	0.0389
29	20	5.47	47.06	90.10	90.60	0.00136	0.00097	0.0681	0.0486

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
30	20	5.52	44.15	90.60	90.90	0.00078	0.00058	0.0389	0.0292
31	20	5.50	45.31	90.50	90.60	0.00136	0.00019	0.0681	0.0097
32	20	5.47	47.00	90.70	90.80	0.00097	0.00019	0.0486	0.0097
33	20	5.41	50.57	90.70	90.80	0.00097	0.00019	0.0486	0.0097
34	20	5.40	51.17	90.80	90.90	0.00078	0.00019	0.0389	0.0097
35	20	5.43	49.44	90.80	90.90	0.00078	0.00019	0.0389	0.0097
36	20	5.44	48.81	90.50	90.50	0.00156	0.00000	0.0778	0.0000
37	20	5.45	48.22	90.50	90.70	0.00117	0.00039	0.0583	0.0194
38	20	5.41	50.55	90.80	91.00	0.00058	0.00039	0.0292	0.0194
39	20	5.48	46.48	90.80	90.90	0.00078	0.00019	0.0389	0.0097
40	20	5.51	44.73	90.80	90.90	0.00078	0.00019	0.0389	0.0097
41	20	5.46	47.64	90.70	90.80	0.00097	0.00019	0.0486	0.0097
42	20	5.48	46.48	90.40	90.60	0.00136	0.00039	0.0681	0.0194
43	20	5.47	47.06	90.70	90.80	0.00097	0.00019	0.0486	0.0097
44	20	5.40	51.14	90.80	90.90	0.00078	0.00019	0.0389	0.0097
45	20	5.42	49.97	90.80	90.90	0.00078	0.00019	0.0389	0.0097
46	20	5.46	47.64	90.70	90.80	0.00097	0.00019	0.0486	0.0097
47	20	5.38	52.30	90.60	90.80	0.00097	0.00039	0.0486	0.0194
48	20	5.40	51.14	90.60	90.70	0.00117	0.00019	0.0583	0.0097
49	20	5.43	49.39	90.30	90.50	0.00156	0.00039	0.0778	0.0194
50	20	5.47	47.06	90.50	90.80	0.00097	0.00058	0.0486	0.0292
51	20	5.48	46.48	90.40	90.60	0.00136	0.00039	0.0681	0.0194
52	20	5.43	49.39	90.70	90.70	0.00117	0.00000	0.0583	0.0000
53	20	5.49	45.89	90.80	90.90	0.00078	0.00019	0.0389	0.0097
54	20	5.46	47.64	90.60	90.80	0.00097	0.00039	0.0486	0.0194
55	20	5.42	49.97	90.60	90.70	0.00117	0.00019	0.0583	0.0097
56	20	5.50	45.31	90.60	90.70	0.00117	0.00019	0.0583	0.0097
57	20	5.51	44.73	90.60	90.80	0.00097	0.00039	0.0486	0.0194
58	20	5.43	49.39	90.70	90.80	0.00097	0.00019	0.0486	0.0097
59	20	5.47	47.06	90.80	90.90	0.00078	0.00019	0.0389	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
60	20	5.50	45.31	90.80	90.90	0.00078	0.00019	0.0389	0.0097
61	20	5.53	43.56	90.80	90.90	0.00078	0.00019	0.0389	0.0097
62	20	5.52	44.15	90.60	90.80	0.00097	0.00039	0.0486	0.0194
63	20	5.52	44.15	90.80	91.00	0.00058	0.00039	0.0292	0.0194
64	20	5.54	42.98	90.80	90.90	0.00078	0.00019	0.0389	0.0097
65	20	5.49	45.89	90.80	90.90	0.00078	0.00019	0.0389	0.0097
66	20	5.47	47.06	90.70	90.80	0.00097	0.00019	0.0486	0.0097
67	20	5.48	46.48	90.40	90.50	0.00156	0.00019	0.0778	0.0097
68	20	5.46	47.64	90.80	90.90	0.00078	0.00019	0.0389	0.0097
69	20	5.47	47.06	90.70	90.80	0.00097	0.00019	0.0486	0.0097
70	20	5.50	45.31	90.40	90.90	0.00078	0.00097	0.0389	0.0486
71	20	5.49	45.89	90.50	90.90	0.00078	0.00078	0.0389	0.0389
72	20	5.46	47.64	90.50	90.70	0.00117	0.00039	0.0583	0.0194
73	20	5.43	49.39	90.70	90.80	0.00097	0.00019	0.0486	0.0097
74	20	5.49	45.89	90.20	90.60	0.00136	0.00078	0.0681	0.0389
75	20	5.52	44.15	90.20	90.80	0.00097	0.00117	0.0486	0.0583
76	20	5.50	45.31	90.10	90.90	0.00078	0.00156	0.0389	0.0778
77	20	5.43	49.39	90.00	90.80	0.00097	0.00156	0.0486	0.0778
78	20	5.46	47.64	90.00	90.70	0.00117	0.00136	0.0583	0.0681
79	20	5.49	45.89	90.10	90.90	0.00078	0.00156	0.0389	0.0778
80	20	5.53	43.56	89.90	91.00	0.00058	0.00214	0.0292	0.1069
81	20	5.50	45.31	89.90	90.90	0.00078	0.00194	0.0389	0.0972
82	20	5.51	44.73	89.70	90.90	0.00078	0.00233	0.0389	0.1167
83	20	5.55	42.40	89.50	90.50	0.00156	0.00194	0.0778	0.0972
84	20	5.53	43.56	89.50	90.10	0.00233	0.00117	0.1167	0.0583
85	20	5.50	45.31	89.20	90.00	0.00253	0.00156	0.1264	0.0778
86	20	5.52	44.15	89.00	89.50	0.00350	0.00097	0.1750	0.0486
87	20	5.52	44.15	88.70	89.20	0.00408	0.00097	0.2042	0.0486
88	20	5.53	43.56	88.60	88.90	0.00467	0.00058	0.2333	0.0292

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.72	90.74	88.20	88.60	0.00525	0.00078	0.2625	0.0389
2	20	4.73	90.15	88.30	88.70	0.00506	0.00078	0.2528	0.0389
3	20	4.75	88.99	88.20	88.70	0.00506	0.00097	0.2528	0.0486
4	20	4.77	87.82	88.20	88.80	0.00486	0.00117	0.2430	0.0583
5	20	4.80	86.08	88.30	88.90	0.00467	0.00117	0.2333	0.0583
6	20	4.82	84.91	88.50	90.00	0.00253	0.00292	0.1264	0.1458
7	20	4.85	83.17	88.60	90.00	0.00253	0.00272	0.1264	0.1361
8	20	4.86	82.58	88.60	90.10	0.00233	0.00292	0.1167	0.1458
9	20	4.87	82.00	88.70	90.10	0.00233	0.00272	0.1167	0.1361
10	20	4.89	80.84	88.90	90.20	0.00214	0.00253	0.1069	0.1264
11	20	4.91	79.67	89.00	90.30	0.00194	0.00253	0.0972	0.1264
12	20	4.92	79.09	89.20	90.40	0.00175	0.00233	0.0875	0.1167
13	20	4.92	79.09	89.30	90.40	0.00175	0.00214	0.0875	0.1069
14	20	4.94	77.92	89.40	90.50	0.00156	0.00214	0.0778	0.1069
15	20	4.91	79.67	89.40	90.40	0.00175	0.00194	0.0875	0.0972
16	20	4.93	78.51	89.50	90.40	0.00175	0.00175	0.0875	0.0875
17	20	4.95	77.34	89.50	90.60	0.00136	0.00214	0.0681	0.1069
18	20	4.96	76.76	89.60	90.50	0.00156	0.00175	0.0778	0.0875
19	20	4.94	77.92	89.70	90.60	0.00136	0.00175	0.0681	0.0875
20	20	4.97	76.18	89.70	90.50	0.00156	0.00156	0.0778	0.0778
21	20	4.99	75.01	89.80	90.60	0.00136	0.00156	0.0681	0.0778
22	20	4.98	75.59	90.00	90.70	0.00117	0.00136	0.0583	0.0681
23	20	4.96	76.76	89.90	90.70	0.00117	0.00156	0.0583	0.0778
24	20	4.97	76.18	90.00	90.80	0.00097	0.00156	0.0486	0.0778
25	20	5.00	74.43	89.90	90.80	0.00097	0.00175	0.0486	0.0875
26	20	5.01	73.85	90.00	90.80	0.00097	0.00156	0.0486	0.0778
27	20	5.00	74.43	90.00	90.90	0.00078	0.00175	0.0389	0.0875
28	20	5.02	73.27	90.10	90.90	0.00078	0.00156	0.0389	0.0778

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
29	20	5.03	72.68	90.10	90.90	0.00078	0.00156	0.0389	0.0778
30	20	5.05	71.52	90.30	90.80	0.00097	0.00097	0.0486	0.0486
31	20	5.06	70.94	90.40	90.80	0.00097	0.00078	0.0486	0.0389
32	20	5.08	69.77	90.50	90.90	0.00078	0.00078	0.0389	0.0389
33	20	5.10	68.61	90.60	91.00	0.00058	0.00078	0.0292	0.0389
34	20	5.11	68.02	90.60	90.90	0.00078	0.00058	0.0389	0.0292
35	20	5.15	65.69	90.70	90.90	0.00078	0.00039	0.0389	0.0194
36	20	5.16	65.11	90.80	90.90	0.00078	0.00019	0.0389	0.0097
37	20	5.19	63.37	90.80	90.90	0.00078	0.00019	0.0389	0.0097
38	20	5.17	64.53	90.90	90.90	0.00078	0.00000	0.0389	0.0000
39	20	5.20	62.78	90.90	91.00	0.00058	0.00019	0.0292	0.0097
40	20	5.22	61.62	90.90	91.00	0.00058	0.00019	0.0292	0.0097
41	20	5.23	61.04	91.00	91.10	0.00039	0.00019	0.0194	0.0097
42	20	5.25	59.87	91.00	91.10	0.00039	0.00019	0.0194	0.0097
43	20	5.26	59.29	91.10	91.20	0.00019	0.00019	0.0097	0.0097
44	20	5.28	58.12	91.20	91.20	0.00019	0.00000	0.0097	0.0000
45	20	5.29	57.54	91.20	91.20	0.00019	0.00000	0.0097	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (2 nd RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.48	46.48	91.20	91.20	0.00019	0.00000	0.0097	0.0000
2	20	5.46	47.64	91.10	91.20	0.00019	0.00019	0.0097	0.0097
3	20	5.49	45.89	90.90	91.10	0.00039	0.00039	0.0194	0.0194
4	20	5.50	45.31	90.90	91.10	0.00039	0.00039	0.0194	0.0194
5	20	5.49	45.89	90.90	91.00	0.00058	0.00019	0.0292	0.0097
6	20	5.51	44.73	90.80	91.00	0.00058	0.00039	0.0292	0.0194
7	20	5.54	42.98	90.80	91.10	0.00039	0.00058	0.0194	0.0292
8	20	5.55	42.40	90.70	91.00	0.00058	0.00058	0.0292	0.0292
9	20	5.56	41.82	90.80	90.90	0.00078	0.00019	0.0389	0.0097
10	20	5.58	40.65	90.70	91.00	0.00058	0.00058	0.0292	0.0292
11	20	5.60	39.49	90.70	91.00	0.00058	0.00058	0.0292	0.0292
12	20	5.62	38.32	90.60	91.00	0.00058	0.00078	0.0292	0.0389
13	20	5.60	39.49	90.50	90.80	0.00097	0.00058	0.0486	0.0292
14	20	5.58	40.65	90.30	90.60	0.00136	0.00058	0.0681	0.0292
15	20	5.55	42.40	90.30	90.50	0.00156	0.00039	0.0778	0.0194
16	20	5.56	41.82	90.00	90.30	0.00194	0.00058	0.0972	0.0292
17	20	5.59	40.07	89.90	90.10	0.00233	0.00039	0.1167	0.0194
18	20	5.54	42.98	89.80	90.10	0.00233	0.00058	0.1167	0.0292
19	20	5.57	41.24	89.60	90.00	0.00253	0.00078	0.1264	0.0389
20	20	5.58	40.65	89.50	90.00	0.00253	0.00097	0.1264	0.0486
21	20	5.53	43.56	89.50	89.90	0.00272	0.00078	0.1361	0.0389
22	20	5.56	41.82	89.60	90.00	0.00253	0.00078	0.1264	0.0389
23	20	5.57	41.24	89.50	90.00	0.00253	0.00097	0.1264	0.0486
24	20	5.60	39.49	89.30	89.90	0.00272	0.00117	0.1361	0.0583
25	20	5.59	40.07	89.30	89.90	0.00272	0.00117	0.1361	0.0583
26	20	5.62	38.32	89.60	89.80	0.00292	0.00039	0.1458	0.0194
27	20	5.63	37.74	89.50	89.80	0.00292	0.00058	0.1458	0.0292
28	20	5.57	41.24	89.50	89.70	0.00311	0.00039	0.1556	0.0194
29	20	5.55	42.40	89.40	89.60	0.00331	0.00039	0.1653	0.0194
30	20	5.60	39.49	89.50	89.60	0.00331	0.00019	0.1653	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (2 nd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.93	78.51	88.20	88.80	0.00486	0.00117	0.2430	0.0583
2	20	4.93	78.51	88.60	89.00	0.00447	0.00078	0.2236	0.0389
3	20	4.92	79.09	88.80	89.20	0.00408	0.00078	0.2042	0.0389
4	20	4.91	79.67	88.90	89.30	0.00389	0.00078	0.1944	0.0389
5	20	4.89	80.84	89.00	89.50	0.00350	0.00097	0.1750	0.0486
6	20	4.90	80.25	89.20	89.60	0.00331	0.00078	0.1653	0.0389
7	100	4.88	81.42	89.30	89.80	0.01458	0.00486	0.1458	0.0486
8	100	4.87	82.00	89.80	90.10	0.01167	0.00292	0.1167	0.0292
9	100	4.85	83.17	89.50	90.40	0.00875	0.00875	0.0875	0.0875
10	100	4.86	82.58	90.10	90.50	0.00778	0.00389	0.0778	0.0389
11	100	4.88	81.42	90.30	90.50	0.00778	0.00194	0.0778	0.0194
12	100	4.79	86.66	90.40	90.60	0.00681	0.00194	0.0681	0.0194
13	100	4.83	84.33	90.60	90.80	0.00486	0.00194	0.0486	0.0194
14	100	4.85	83.17	90.70	90.90	0.00389	0.00194	0.0389	0.0194
15	100	4.86	82.58	90.80	90.90	0.00389	0.00097	0.0389	0.0097
16	100	4.84	83.75	90.90	91.10	0.00194	0.00194	0.0194	0.0194
17	100	4.85	83.17	91.10	91.20	0.00097	0.00097	0.0097	0.0097
18	20	4.85	83.17	91.10	91.20	0.00019	0.00019	0.0097	0.0097
19	20	4.84	83.75	91.20	91.20	0.00019	0.00000	0.0097	0.0000
20	20	4.87	82.00	91.20	91.20	0.00019	0.00000	0.0097	0.0000
21	20	4.86	82.58	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (3rd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.87	82.00	88.30	88.50	0.02722	0.00194	0.2722	0.0194
2	100	4.84	83.75	88.20	88.80	0.02430	0.00583	0.2430	0.0583
3	100	4.82	84.91	88.50	89.30	0.01944	0.00778	0.1944	0.0778
4	100	4.77	87.82	88.90	89.70	0.01556	0.00778	0.1556	0.0778
5	100	4.71	91.32	89.20	90.10	0.01167	0.00875	0.1167	0.0875
6	100	4.69	92.48	90.20	90.40	0.00875	0.00194	0.0875	0.0194
7	100	4.64	95.39	90.50	90.70	0.00583	0.00194	0.0583	0.0194
8	100	4.63	95.98	90.90	91.00	0.00292	0.00097	0.0292	0.0097
9	100	4.61	97.14	91.20	91.20	0.00097	0.00000	0.0097	0.0000
10	20	4.60	97.72	91.20	91.20	0.00019	0.00000	0.0097	0.0000
11	20	4.58	98.89	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 6 : (4th REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.75	88.99	87.30	87.40	0.03792	0.00097	0.3792	0.0097
2	100	4.70	91.90	87.40	87.70	0.03500	0.00292	0.3500	0.0292
3	100	4.61	97.14	88.10	88.20	0.03014	0.00097	0.3014	0.0097
4	100	4.53	101.80	88.80	88.90	0.02333	0.00097	0.2333	0.0097
5	100	4.49	104.13	89.40	89.50	0.01750	0.00097	0.1750	0.0097
6	100	4.42	108.21	89.90	90.10	0.01167	0.00194	0.1167	0.0194
7	100	4.36	111.70	90.70	90.80	0.00486	0.00097	0.0486	0.0097
8	100	4.31	114.61	91.10	91.20	0.00097	0.00097	0.0097	0.0097
9	20	4.28	116.36	91.20	91.20	0.00019	0.00000	0.0097	0.0000
10	20	4.27	116.94	91.20	91.20	0.00019	0.00000	0.0097	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 8 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.92	79.09	91.00	91.20	0.00019	0.00039	0.0097	0.0194
2	20	4.90	80.25	91.00	91.10	0.00039	0.00019	0.0194	0.0097
3	20	4.85	83.17	91.00	91.10	0.00039	0.00019	0.0194	0.0097
4	20	4.82	84.91	90.90	91.00	0.00058	0.00019	0.0292	0.0097
5	20	4.81	85.49	91.00	91.00	0.00058	0.00000	0.0292	0.0000
6	20	4.80	86.08	90.60	90.90	0.00078	0.00058	0.0389	0.0292
7	20	4.79	86.66	90.90	91.00	0.00058	0.00019	0.0292	0.0097
8	20	4.76	88.41	90.80	91.00	0.00058	0.00039	0.0292	0.0194
9	20	4.77	87.82	90.80	90.90	0.00078	0.00019	0.0389	0.0097
10	20	4.71	91.32	90.90	91.00	0.00058	0.00019	0.0292	0.0097
11	20	4.74	89.57	90.70	90.90	0.00078	0.00039	0.0389	0.0194
12	20	4.75	88.99	90.90	91.00	0.00058	0.00019	0.0292	0.0097
13	20	4.83	84.33	90.90	91.00	0.00058	0.00019	0.0292	0.0097
14	20	4.97	76.18	90.90	91.00	0.00058	0.00019	0.0292	0.0097
15	20	5.19	63.37	90.90	91.00	0.00058	0.00019	0.0292	0.0097
16	20	5.25	59.87	90.80	91.00	0.00058	0.00039	0.0292	0.0194
17	20	5.53	43.56	90.80	91.00	0.00058	0.00039	0.0292	0.0194
18	20	5.61	38.91	91.00	91.00	0.00058	0.00000	0.0292	0.0000
19	20	5.56	41.82	90.70	90.90	0.00078	0.00039	0.0389	0.0194
20	20	5.48	46.48	90.80	90.90	0.00078	0.00019	0.0389	0.0097
21	20	5.50	45.31	90.80	90.90	0.00078	0.00019	0.0389	0.0097
22	20	5.42	49.97	90.80	90.90	0.00078	0.00019	0.0389	0.0097
23	20	5.49	45.89	90.70	90.90	0.00078	0.00039	0.0389	0.0194
24	20	5.59	40.07	90.80	90.90	0.00078	0.00019	0.0389	0.0097
25	20	5.56	41.82	90.90	91.00	0.00058	0.00019	0.0292	0.0097
26	20	5.60	39.49	90.80	90.90	0.00078	0.00019	0.0389	0.0097
27	20	5.52	44.15	90.80	90.90	0.00078	0.00019	0.0389	0.0097
28	20	5.57	41.24	90.80	91.00	0.00058	0.00039	0.0292	0.0194
29	20	5.54	42.98	90.70	90.90	0.00078	0.00039	0.0389	0.0194

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 8 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
30	20	5.52	44.15	90.70	90.90	0.00078	0.00039	0.0389	0.0194
31	20	5.58	40.65	90.80	90.90	0.00078	0.00019	0.0389	0.0097
32	20	5.56	41.82	90.80	90.90	0.00078	0.00019	0.0389	0.0097
33	20	5.57	41.24	90.80	90.90	0.00078	0.00019	0.0389	0.0097
34	20	5.52	44.15	90.70	90.90	0.00078	0.00039	0.0389	0.0194
35	20	5.55	42.40	90.80	90.90	0.00078	0.00019	0.0389	0.0097
36	20	5.58	40.65	90.70	90.90	0.00078	0.00039	0.0389	0.0194
37	20	5.52	44.15	90.80	90.90	0.00078	0.00019	0.0389	0.0097
38	20	5.51	44.73	90.80	90.90	0.00078	0.00019	0.0389	0.0097
39	20	5.53	43.56	90.70	90.90	0.00078	0.00039	0.0389	0.0194
40	20	5.51	44.73	90.70	90.90	0.00078	0.00039	0.0389	0.0194
41	20	5.50	45.31	90.80	90.90	0.00078	0.00019	0.0389	0.0097
42	20	5.49	45.89	90.70	90.80	0.00097	0.00019	0.0486	0.0097
43	20	5.50	45.31	90.80	90.90	0.00078	0.00019	0.0389	0.0097
44	20	5.48	46.48	90.80	90.90	0.00078	0.00019	0.0389	0.0097
45	20	5.45	48.22	90.70	90.90	0.00078	0.00039	0.0389	0.0194
46	20	5.47	47.06	90.70	90.90	0.00078	0.00039	0.0389	0.0194
47	20	5.46	47.64	90.80	90.90	0.00078	0.00019	0.0389	0.0097
48	20	5.48	46.48	90.80	90.90	0.00078	0.00019	0.0389	0.0097
49	20	5.44	48.81	90.70	90.80	0.00097	0.00019	0.0486	0.0097
50	20	5.50	45.31	90.70	90.90	0.00078	0.00039	0.0389	0.0194
51	20	5.49	45.89	90.80	90.90	0.00078	0.00019	0.0389	0.0097
52	20	5.47	47.06	90.60	90.80	0.00097	0.00039	0.0486	0.0194
53	20	5.44	48.81	90.70	90.80	0.00097	0.00019	0.0486	0.0097
54	20	5.41	50.55	90.70	90.80	0.00097	0.00019	0.0486	0.0097
55	20	5.43	49.39	90.60	90.80	0.00097	0.00039	0.0486	0.0194
56	20	5.46	47.64	90.70	90.80	0.00097	0.00019	0.0486	0.0097
57	20	5.48	46.48	90.70	90.80	0.00097	0.00019	0.0486	0.0097
58	20	5.50	45.31	90.60	90.80	0.00097	0.00039	0.0486	0.0194
59	20	5.46	47.64	90.40	90.80	0.00097	0.00078	0.0486	0.0389

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 8 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.12	67.44	88.10	88.70	0.00506	0.00117	0.2528	0.0583
2	20	5.13	66.86	88.00	89.10	0.00428	0.00214	0.2139	0.1069
3	20	5.15	65.69	88.10	89.60	0.00331	0.00292	0.1653	0.1458
4	20	5.17	64.53	88.20	89.90	0.00272	0.00331	0.1361	0.1653
5	20	5.18	63.95	88.30	90.20	0.00214	0.00369	0.1069	0.1847
6	20	5.20	62.78	88.40	90.30	0.00194	0.00369	0.0972	0.1847
7	20	5.21	62.20	88.40	90.30	0.00194	0.00369	0.0972	0.1847
8	20	5.24	60.45	88.50	90.40	0.00175	0.00369	0.0875	0.1847
9	20	5.27	58.71	88.60	90.50	0.00156	0.00369	0.0778	0.1847
10	20	5.29	57.54	88.70	90.60	0.00136	0.00369	0.0681	0.1847
11	20	5.34	54.63	88.80	90.80	0.00097	0.00389	0.0486	0.1944
12	20	5.38	52.30	89.00	90.70	0.00117	0.00331	0.0583	0.1653
13	20	5.40	51.14	89.10	90.50	0.00156	0.00272	0.0778	0.1361
14	20	5.39	51.72	89.20	90.60	0.00136	0.00272	0.0681	0.1361
15	20	5.37	52.88	89.20	90.70	0.00117	0.00292	0.0583	0.1458
16	20	5.41	50.55	89.30	90.70	0.00117	0.00272	0.0583	0.1361
17	20	5.42	49.97	89.50	90.90	0.00078	0.00272	0.0389	0.1361
18	20	5.44	48.81	89.50	90.90	0.00078	0.00272	0.0389	0.1361
19	20	5.48	46.48	89.60	90.90	0.00078	0.00253	0.0389	0.1264
20	20	5.45	48.22	89.70	90.90	0.00078	0.00233	0.0389	0.1167
21	20	5.37	52.88	89.70	90.90	0.00078	0.00233	0.0389	0.1167
22	20	5.42	49.97	89.80	90.90	0.00078	0.00214	0.0389	0.1069
23	20	5.45	48.22	90.00	90.90	0.00078	0.00175	0.0389	0.0875
24	20	5.50	45.31	90.10	90.90	0.00078	0.00156	0.0389	0.0778
25	20	5.47	47.06	90.20	91.00	0.00058	0.00156	0.0292	0.0778
26	20	5.45	48.22	90.30	90.90	0.00078	0.00117	0.0389	0.0583
27	20	5.44	48.81	90.30	91.00	0.00058	0.00136	0.0292	0.0681
28	20	5.41	50.55	90.40	91.10	0.00039	0.00136	0.0194	0.0681

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 8 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
29	20	5.42	49.97	90.50	91.10	0.00039	0.00117	0.0194	0.0583
30	20	5.44	48.81	90.80	91.20	0.00019	0.00078	0.0097	0.0389
31	20	5.40	51.14	90.90	91.10	0.00039	0.00039	0.0194	0.0194
32	20	5.39	51.72	91.10	91.20	0.00019	0.00019	0.0097	0.0097
33	20	5.37	52.88	91.10	91.20	0.00019	0.00019	0.0097	0.0097
34	20	5.35	54.05	91.20	91.30	0.00000	0.00019	0.0000	0.0097
35	20	5.36	53.47	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 8 : (2nd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.37	52.88	86.40	88.80	0.02430	0.02333	0.2430	0.2333
2	100	5.36	53.47	86.80	89.00	0.02236	0.02139	0.2236	0.2139
3	100	5.33	55.21	87.30	89.30	0.01944	0.01944	0.1944	0.1944
4	100	5.34	54.63	87.60	89.70	0.01556	0.02042	0.1556	0.2042
5	100	5.31	56.38	87.90	90.00	0.01264	0.02042	0.1264	0.2042
6	100	5.29	57.54	88.20	90.10	0.01167	0.01847	0.1167	0.1847
7	100	5.28	58.12	88.30	90.40	0.00875	0.02042	0.0875	0.2042
8	100	5.25	59.87	88.50	90.60	0.00681	0.02042	0.0681	0.2042
9	100	5.24	60.45	88.80	90.80	0.00486	0.01944	0.0486	0.1944
10	100	5.23	61.04	89.10	90.90	0.00389	0.01750	0.0389	0.1750
11	100	5.20	62.78	90.00	91.00	0.00292	0.00972	0.0292	0.0972
12	100	5.17	64.53	90.60	91.10	0.00194	0.00486	0.0194	0.0486
13	100	5.16	65.11	91.00	91.20	0.00097	0.00194	0.0097	0.0194
14	100	5.11	68.02	91.20	91.30	0.00000	0.00097	0.0000	0.0097
15	20	5.04	72.10	91.20	91.30	0.00000	0.00019	0.0000	0.0097
16	20	5.03	72.68	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 8 : (3 rd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	6.35	-4.19	87.50	88.90	0.02333	0.01361	0.2333	0.1361
2	100	6.24	2.22	87.80	89.20	0.02042	0.01361	0.2042	0.1361
3	100	6.11	9.79	88.20	89.50	0.01750	0.01264	0.1750	0.1264
4	100	6.05	13.28	88.40	89.80	0.01458	0.01361	0.1458	0.1361
5	100	5.86	24.35	88.80	90.00	0.01264	0.01167	0.1264	0.1167
6	100	5.74	31.34	89.20	90.20	0.01069	0.00972	0.1069	0.0972
7	100	5.49	45.89	89.70	90.30	0.00972	0.00583	0.0972	0.0583
8	100	5.36	53.47	90.00	90.50	0.00778	0.00486	0.0778	0.0486
9	100	5.17	64.53	90.30	90.80	0.00486	0.00486	0.0486	0.0486
10	100	4.95	77.34	90.70	91.00	0.00292	0.00292	0.0292	0.0292
11	100	4.88	81.42	90.90	91.10	0.00194	0.00194	0.0194	0.0194
12	100	4.73	90.15	91.00	91.20	0.00097	0.00194	0.0097	0.0194
13	100	4.52	102.38	91.20	91.30	0.00000	0.00097	0.0000	0.0097
14	20	4.50	103.55	91.20	91.30	0.00000	0.00019	0.0000	0.0097
15	20	4.47	105.30	91.20	91.30	0.00000	0.00019	0.0000	0.0097
16	20	4.46	105.88	91.20	91.30	0.00000	0.00019	0.0000	0.0097
17	20	4.44	107.04	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 50 mg./l. , pH 8 : (4th REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	6.59	-18.17	88.30	88.80	0.02430	0.00486	0.2430	0.0486
2	100	5.45	48.22	89.40	90.10	0.01167	0.00681	0.1167	0.0681
3	100	4.62	96.56	90.60	90.80	0.00486	0.00194	0.0486	0.0194
4	100	4.37	111.12	91.00	91.10	0.00194	0.00097	0.0194	0.0097
5	20	4.34	112.87	91.20	91.20	0.00019	0.00000	0.0097	0.0000
6	20	4.32	114.03	91.20	91.20	0.00019	0.00000	0.0097	0.0000
7	20	4.30	115.20	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 4 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.91	79.67	91.20	91.30	0.00000	0.00019	0.0000	0.0097
2	20	4.88	81.42	91.20	91.30	0.00000	0.00019	0.0000	0.0097
3	20	4.85	83.17	91.10	91.20	0.00019	0.00019	0.0097	0.0097
4	20	4.81	85.49	91.10	91.20	0.00019	0.00019	0.0097	0.0097
5	20	4.80	86.08	91.00	91.20	0.00019	0.00039	0.0097	0.0194
6	20	4.76	88.41	91.10	91.20	0.00019	0.00019	0.0097	0.0097
7	20	4.72	90.74	91.00	91.20	0.00019	0.00039	0.0097	0.0194
8	20	4.70	91.90	91.00	91.10	0.00039	0.00019	0.0194	0.0097
9	20	4.63	95.98	90.90	91.00	0.00058	0.00019	0.0292	0.0097
10	20	4.61	97.14	90.80	90.90	0.00078	0.00019	0.0389	0.0097
11	20	4.58	98.89	90.60	90.80	0.00097	0.00039	0.0486	0.0194
12	20	4.69	92.48	90.80	90.90	0.00078	0.00019	0.0389	0.0097
13	20	4.76	88.41	90.70	90.90	0.00078	0.00039	0.0389	0.0194
14	20	4.85	83.17	90.80	90.90	0.00078	0.00019	0.0389	0.0097
15	20	4.79	86.66	90.50	90.70	0.00117	0.00039	0.0583	0.0194
16	20	4.82	84.91	90.70	90.90	0.00078	0.00039	0.0389	0.0194
17	20	4.87	82.00	90.50	90.90	0.00078	0.00078	0.0389	0.0389
18	20	4.90	80.25	90.60	90.90	0.00078	0.00058	0.0389	0.0292
19	20	4.92	79.09	90.70	90.90	0.00078	0.00039	0.0389	0.0194
20	20	4.99	75.01	90.60	90.90	0.00078	0.00058	0.0389	0.0292
21	20	5.08	69.77	90.50	90.90	0.00078	0.00078	0.0389	0.0389
22	20	5.11	68.02	90.50	90.80	0.00097	0.00058	0.0486	0.0292
23	20	5.18	63.95	90.40	90.90	0.00078	0.00097	0.0389	0.0486
24	20	5.11	68.02	90.70	90.80	0.00097	0.00019	0.0486	0.0097
25	20	5.14	66.28	90.60	90.80	0.00097	0.00039	0.0486	0.0194
26	20	5.09	69.19	90.50	90.70	0.00117	0.00039	0.0583	0.0194
27	20	5.10	68.61	90.40	90.70	0.00117	0.00058	0.0583	0.0292
28	20	5.07	70.35	90.40	90.60	0.00136	0.00039	0.0681	0.0194
29	20	4.95	77.34	90.30	90.70	0.00117	0.00078	0.0583	0.0389

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 4 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.97	76.18	88.40	88.70	0.00506	0.00058	0.2528	0.0292
2	20	4.95	77.34	88.60	88.80	0.00486	0.00039	0.2430	0.0194
3	20	4.92	79.09	88.80	89.00	0.00447	0.00039	0.2236	0.0194
4	20	4.91	79.67	88.90	89.10	0.00428	0.00039	0.2139	0.0194
5	20	4.88	81.42	89.00	89.20	0.00408	0.00039	0.2042	0.0194
6	20	4.85	83.17	89.00	89.30	0.00389	0.00058	0.1944	0.0292
7	20	4.81	85.49	89.20	89.50	0.00350	0.00058	0.1750	0.0292
8	20	4.75	88.99	89.40	89.60	0.00331	0.00039	0.1653	0.0194
9	20	4.79	86.66	89.60	89.80	0.00292	0.00039	0.1458	0.0194
10	20	4.81	85.49	90.00	90.00	0.00253	0.00000	0.1264	0.0000
11	20	4.86	82.58	90.20	90.20	0.00214	0.00000	0.1069	0.0000
12	20	4.85	83.17	90.30	90.40	0.00175	0.00019	0.0875	0.0097
13	20	4.76	88.41	90.30	90.60	0.00136	0.00058	0.0681	0.0292
14	20	4.82	84.91	90.40	90.70	0.00117	0.00058	0.0583	0.0292
15	20	4.88	81.42	90.40	90.70	0.00117	0.00058	0.0583	0.0292
16	20	4.96	76.76	90.40	90.80	0.00097	0.00078	0.0486	0.0389
17	20	5.03	72.68	90.50	90.80	0.00097	0.00058	0.0486	0.0292
18	20	5.11	68.02	90.50	90.80	0.00097	0.00058	0.0486	0.0292
19	20	5.16	65.11	90.50	90.80	0.00097	0.00058	0.0486	0.0292
20	20	5.24	60.45	90.50	90.90	0.00078	0.00078	0.0389	0.0389
21	20	5.12	67.44	90.60	90.90	0.00078	0.00058	0.0389	0.0292
22	20	5.09	69.19	90.60	90.90	0.00078	0.00058	0.0389	0.0292
23	20	5.02	73.27	90.60	90.90	0.00078	0.00058	0.0389	0.0292
24	20	5.10	68.61	90.70	90.90	0.00078	0.00039	0.0389	0.0194
25	20	5.16	65.11	90.80	90.90	0.00078	0.00019	0.0389	0.0097
26	20	5.13	66.86	90.80	91.00	0.00058	0.00039	0.0292	0.0194
27	20	5.18	63.95	90.70	90.90	0.00078	0.00039	0.0389	0.0194
28	20	5.21	62.20	90.80	90.90	0.00078	0.00019	0.0389	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 4 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
29	20	5.30	56.96	90.80	90.90	0.00078	0.00019	0.0389	0.0097
30	20	5.24	60.45	90.70	90.90	0.00078	0.00039	0.0389	0.0194
31	20	5.18	63.95	90.90	91.00	0.00058	0.00019	0.0292	0.0097
32	20	5.15	65.69	90.80	90.90	0.00078	0.00019	0.0389	0.0097
33	20	5.12	67.44	90.90	91.00	0.00058	0.00019	0.0292	0.0097
34	20	5.04	72.10	90.90	91.00	0.00058	0.00019	0.0292	0.0097
35	20	5.03	72.68	90.90	91.10	0.00039	0.00039	0.0194	0.0194
36	20	5.26	59.29	91.00	91.10	0.00039	0.00019	0.0194	0.0097
37	20	5.14	66.28	91.00	91.10	0.00039	0.00019	0.0194	0.0097
38	20	5.18	63.95	91.10	91.20	0.00019	0.00019	0.0097	0.0097
39	20	5.11	68.02	91.00	91.10	0.00039	0.00019	0.0194	0.0097
40	20	5.06	70.94	91.10	91.10	0.00039	0.00000	0.0194	0.0000
41	20	5.13	66.86	91.10	91.20	0.00019	0.00019	0.0097	0.0097
42	20	5.19	63.37	91.20	91.30	0.00000	0.00019	0.0000	0.0097
43	20	5.20	62.78	91.00	91.20	0.00019	0.00039	0.0097	0.0194
44	20	5.17	64.53	91.00	91.20	0.00019	0.00039	0.0097	0.0194
45	20	5.15	65.69	91.00	91.30	0.00000	0.00058	0.0000	0.0292
46	20	5.12	67.44	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 4 : (2 nd RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.03	72.68	91.20	91.30	0.00000	0.00019	0.0000	0.0097
2	20	5.01	73.85	91.20	91.30	0.00000	0.00019	0.0000	0.0097
3	20	4.98	75.59	91.20	91.20	0.00019	0.00000	0.0097	0.0000
4	20	4.90	80.25	91.00	91.10	0.00039	0.00019	0.0194	0.0097
5	20	4.87	82.00	90.90	91.00	0.00058	0.00019	0.0292	0.0097
6	20	4.85	83.17	90.90	91.00	0.00058	0.00019	0.0292	0.0097
7	20	5.18	63.95	90.70	90.80	0.00097	0.00019	0.0486	0.0097
8	20	5.20	62.78	90.50	90.70	0.00117	0.00039	0.0583	0.0194
9	20	5.23	61.04	90.40	90.50	0.00156	0.00019	0.0778	0.0097
10	20	5.28	58.12	90.30	90.40	0.00175	0.00019	0.0875	0.0097
11	20	5.32	55.79	90.20	90.30	0.00194	0.00019	0.0972	0.0097
12	20	5.44	48.81	90.10	90.20	0.00214	0.00019	0.1069	0.0097
13	20	5.43	49.39	90.00	90.10	0.00233	0.00019	0.1167	0.0097
14	20	5.48	46.48	89.90	90.00	0.00253	0.00019	0.1264	0.0097
15	20	5.50	45.31	89.80	89.90	0.00272	0.00019	0.1361	0.0097
16	20	5.49	45.89	89.80	89.90	0.00272	0.00019	0.1361	0.0097
17	20	5.46	47.64	89.70	89.80	0.00292	0.00019	0.1458	0.0097
18	20	5.45	48.22	89.70	89.80	0.00292	0.00019	0.1458	0.0097
19	20	5.42	49.97	89.60	89.70	0.00311	0.00019	0.1556	0.0097
20	20	5.40	51.14	89.50	89.60	0.00331	0.00019	0.1653	0.0097
21	20	5.41	50.55	89.40	89.50	0.00350	0.00019	0.1750	0.0097
22	20	5.45	48.22	89.30	89.50	0.00350	0.00039	0.1750	0.0194
23	20	5.40	51.14	89.20	89.40	0.00369	0.00039	0.1847	0.0194
24	20	5.38	52.30	89.20	89.30	0.00389	0.00019	0.1944	0.0097
25	20	5.37	52.88	89.10	89.30	0.00389	0.00039	0.1944	0.0194
26	20	5.33	55.21	89.00	89.10	0.00428	0.00019	0.2139	0.0097
27	20	5.34	54.63	88.80	89.00	0.00447	0.00039	0.2236	0.0194
28	20	5.31	56.38	88.90	89.00	0.00447	0.00019	0.2236	0.0097
29	20	5.30	56.96	88.80	88.90	0.00467	0.00019	0.2333	0.0097
30	20	5.28	58.12	88.60	88.90	0.00467	0.00058	0.2333	0.0292

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 4 : (2 nd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.79	86.66	88.90	89.20	0.02042	0.00292	0.2042	0.0292
2	100	4.81	85.49	89.10	89.50	0.01750	0.00389	0.1750	0.0389
3	100	4.84	83.75	89.30	89.70	0.01556	0.00389	0.1556	0.0389
4	100	4.82	84.91	89.90	90.10	0.01167	0.00194	0.1167	0.0194
5	100	4.85	83.17	90.30	90.40	0.00875	0.00097	0.0875	0.0097
6	100	4.86	82.58	90.50	90.60	0.00681	0.00097	0.0681	0.0097
7	100	4.90	80.25	90.60	90.70	0.00583	0.00097	0.0583	0.0097
8	100	4.93	78.51	90.60	90.70	0.00583	0.00097	0.0583	0.0097
9	100	4.95	77.34	90.80	90.90	0.00389	0.00097	0.0389	0.0097
10	100	4.98	75.59	90.90	91.00	0.00292	0.00097	0.0292	0.0097
11	100	5.01	73.85	90.90	91.10	0.00194	0.00194	0.0194	0.0194
12	100	5.05	71.52	91.10	91.20	0.00097	0.00097	0.0097	0.0097
13	100	5.07	70.35	91.30	91.30	0.00000	0.00000	0.0000	0.0000
14	20	5.08	69.77	91.30	91.30	0.00000	0.00000	0.0000	0.0000



SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 4 : (3rd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.49	104.13	88.50	88.90	0.02333	0.00389	0.2333	0.0389
2	100	4.47	105.30	88.80	89.20	0.02042	0.00389	0.2042	0.0389
3	100	4.50	103.55	89.20	89.50	0.01750	0.00292	0.1750	0.0292
4	100	4.55	100.64	89.50	89.90	0.01361	0.00389	0.1361	0.0389
5	100	4.56	100.05	90.00	90.20	0.01069	0.00194	0.1069	0.0194
6	100	4.59	98.31	90.30	90.40	0.00875	0.00097	0.0875	0.0097
7	100	4.63	95.98	90.30	90.40	0.00875	0.00097	0.0875	0.0097
8	100	4.66	94.23	90.50	90.60	0.00681	0.00097	0.0681	0.0097
9	100	4.68	93.07	90.60	90.70	0.00583	0.00097	0.0583	0.0097
10	100	4.65	94.81	90.70	90.90	0.00389	0.00194	0.0389	0.0194
11	100	4.69	92.48	90.90	91.00	0.00292	0.00097	0.0292	0.0097
12	20	4.71	91.32	91.20	91.20	0.00019	0.00000	0.0097	0.0000
13	20	4.70	91.90	91.20	91.20	0.00019	0.00000	0.0097	0.0000
14	20	4.72	90.74	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 4 : (4th REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.37	111.12	88.90	89.10	0.02139	0.00194	0.2139	0.0194
2	100	4.41	108.79	89.60	89.70	0.01556	0.00097	0.1556	0.0097
3	100	4.47	105.30	90.10	90.20	0.01069	0.00097	0.1069	0.0097
4	100	4.51	102.97	90.50	90.60	0.00681	0.00097	0.0681	0.0097
5	100	4.52	102.38	91.20	91.20	0.00097	0.00000	0.0097	0.0000
6	20	4.50	103.55	91.20	91.20	0.00019	0.00000	0.0097	0.0000
7	20	4.51	102.97	91.20	91.30	0.00000	0.00019	0.0000	0.0097
8	20	4.53	101.80	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 6 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.82	84.91	91.30	91.30	0.00000	0.00000	0.0000	0.0000
2	20	4.91	79.67	91.20	91.30	0.00000	0.00019	0.0000	0.0097
3	20	5.10	68.61	91.20	91.20	0.00019	0.00000	0.0097	0.0000
4	20	5.02	73.27	91.10	91.20	0.00019	0.00019	0.0097	0.0097
5	20	4.99	75.01	91.00	91.10	0.00039	0.00019	0.0194	0.0097
6	20	5.10	68.61	90.90	91.00	0.00058	0.00019	0.0292	0.0097
7	20	5.16	65.11	90.90	91.00	0.00058	0.00019	0.0292	0.0097
8	20	5.22	61.62	90.60	90.90	0.00078	0.00058	0.0389	0.0292
9	20	5.18	63.95	90.60	90.90	0.00078	0.00058	0.0389	0.0292
10	20	5.27	58.71	90.50	90.90	0.00078	0.00078	0.0389	0.0389
11	20	5.33	55.21	90.50	90.90	0.00078	0.00078	0.0389	0.0389
12	20	5.30	56.96	90.30	90.90	0.00078	0.00117	0.0389	0.0583
13	20	5.23	61.04	90.40	90.90	0.00078	0.00097	0.0389	0.0486
14	20	5.15	65.69	90.30	90.90	0.00078	0.00117	0.0389	0.0583
15	20	5.28	58.12	90.50	90.90	0.00078	0.00078	0.0389	0.0389
16	20	5.39	51.72	90.10	91.00	0.00058	0.00175	0.0292	0.0875
17	20	5.35	54.05	90.40	90.90	0.00078	0.00097	0.0389	0.0486
18	20	5.31	56.38	90.30	90.80	0.00097	0.00097	0.0486	0.0486
19	20	5.30	56.96	90.30	90.80	0.00097	0.00097	0.0486	0.0486
20	20	5.26	59.29	90.30	90.80	0.00097	0.00097	0.0486	0.0486
21	20	5.21	62.20	90.20	90.70	0.00117	0.00097	0.0583	0.0486
22	20	5.25	59.87	90.20	90.70	0.00117	0.00097	0.0583	0.0486
23	20	5.33	55.21	90.10	90.60	0.00136	0.00097	0.0681	0.0486
24	20	5.13	66.86	90.00	90.60	0.00136	0.00117	0.0681	0.0583
25	20	5.17	64.53	89.90	90.60	0.00136	0.00136	0.0681	0.0681
26	20	5.12	67.44	89.90	90.50	0.00156	0.00117	0.0778	0.0583
27	20	5.10	68.61	89.60	90.40	0.00175	0.00156	0.0875	0.0778
28	20	4.98	75.59	89.70	90.40	0.00175	0.00136	0.0875	0.0681
29	20	4.99	75.01	89.60	90.30	0.00194	0.00136	0.0972	0.0681

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 6 : (1 st REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.34	54.63	88.30	88.60	0.00525	0.00058	0.2625	0.0292
2	20	5.40	51.14	88.40	88.60	0.00525	0.00039	0.2625	0.0194
3	20	5.38	52.30	88.40	88.70	0.00506	0.00058	0.2528	0.0292
4	20	5.33	55.21	88.50	88.80	0.00486	0.00058	0.2430	0.0292
5	20	5.35	54.05	88.40	88.80	0.00486	0.00078	0.2430	0.0389
6	20	5.34	54.63	88.50	88.90	0.00467	0.00078	0.2333	0.0389
7	20	5.30	56.96	88.60	89.10	0.00428	0.00097	0.2139	0.0486
8	20	5.28	58.12	88.80	89.20	0.00408	0.00078	0.2042	0.0389
9	20	5.31	56.38	88.90	89.30	0.00389	0.00078	0.1944	0.0389
10	20	5.27	58.71	88.90	89.30	0.00389	0.00078	0.1944	0.0389
11	20	5.25	59.87	89.10	89.40	0.00369	0.00058	0.1847	0.0292
12	20	5.28	58.12	89.20	89.60	0.00331	0.00078	0.1653	0.0389
13	20	5.20	62.78	89.30	89.70	0.00311	0.00078	0.1556	0.0389
14	20	5.18	63.95	89.30	89.90	0.00272	0.00117	0.1361	0.0583
15	20	5.14	66.28	89.50	89.90	0.00272	0.00078	0.1361	0.0389
16	20	5.21	62.20	89.70	90.00	0.00253	0.00058	0.1264	0.0292
17	20	5.22	61.62	89.90	90.10	0.00233	0.00039	0.1167	0.0194
18	20	5.30	56.96	89.90	90.10	0.00233	0.00039	0.1167	0.0194
19	20	5.26	59.29	90.00	90.20	0.00214	0.00039	0.1069	0.0194
20	20	5.24	60.45	90.00	90.20	0.00214	0.00039	0.1069	0.0194
21	20	5.22	61.62	90.10	90.30	0.00194	0.00039	0.0972	0.0194
22	20	5.19	63.37	90.10	90.40	0.00175	0.00058	0.0875	0.0292
23	20	5.20	62.78	90.20	90.50	0.00156	0.00058	0.0778	0.0292
24	20	5.24	60.45	90.40	90.60	0.00136	0.00039	0.0681	0.0194
25	20	5.36	53.47	90.40	90.70	0.00117	0.00058	0.0583	0.0292
26	20	5.32	55.79	90.50	90.70	0.00117	0.00039	0.0583	0.0194
27	20	5.28	58.12	90.60	90.80	0.00097	0.00039	0.0486	0.0194
28	20	5.25	59.87	90.60	90.80	0.00097	0.00039	0.0486	0.0194

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 6 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
29	20	5.31	56.38	90.80	90.90	0.00078	0.00019	0.0389	0.0097
30	20	5.29	57.54	90.90	91.00	0.00058	0.00019	0.0292	0.0097
31	20	5.24	60.45	91.00	91.00	0.00058	0.00000	0.0292	0.0000
32	20	5.21	62.20	91.10	91.10	0.00039	0.00000	0.0194	0.0000
33	20	5.15	65.69	91.10	91.20	0.00019	0.00019	0.0097	0.0097
34	20	5.20	62.78	91.10	91.20	0.00019	0.00019	0.0097	0.0097
35	20	5.26	59.29	91.20	91.30	0.00000	0.00019	0.0000	0.0097
36	20	5.21	62.20	91.20	91.20	0.00019	0.00000	0.0097	0.0000
37	20	5.19	63.37	91.20	91.30	0.00000	0.00019	0.0000	0.0097
38	20	5.16	65.11	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 6 : (2 nd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.56	41.82	89.00	89.20	0.02042	0.00194	0.2042	0.0194
2	100	5.42	49.97	89.30	89.60	0.01653	0.00292	0.1653	0.0292
3	100	5.23	61.04	89.80	90.00	0.01264	0.00194	0.1264	0.0194
4	100	5.17	64.53	90.30	90.40	0.00875	0.00097	0.0875	0.0097
5	100	5.06	70.94	90.60	90.70	0.00583	0.00097	0.0583	0.0097
6	100	4.95	77.34	90.70	90.90	0.00389	0.00194	0.0389	0.0194
7	100	4.89	80.84	89.90	91.10	0.00194	0.01167	0.0194	0.1167
8	100	4.84	83.75	91.00	91.20	0.00097	0.00194	0.0097	0.0194
9	100	4.81	85.49	91.20	91.30	0.00000	0.00097	0.0000	0.0097
10	20	4.79	86.66	91.20	91.30	0.00000	0.00019	0.0000	0.0097
11	20	4.76	88.41	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 6 : (3rd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.68	34.83	88.90	89.20	0.02042	0.00292	0.2042	0.0292
2	100	5.35	54.05	89.40	89.60	0.01653	0.00194	0.1653	0.0194
3	100	5.12	67.44	89.90	90.10	0.01167	0.00194	0.1167	0.0194
4	100	4.86	82.58	90.30	90.40	0.00875	0.00097	0.0875	0.0097
5	100	4.77	87.82	90.40	90.50	0.00778	0.00097	0.0778	0.0097
6	100	4.63	95.98	90.60	90.80	0.00486	0.00194	0.0486	0.0194
7	100	4.51	102.97	90.90	91.00	0.00292	0.00097	0.0292	0.0097
8	100	4.48	104.71	91.20	91.30	0.00000	0.00097	0.0000	0.0097
9	20	4.44	107.04	91.20	91.30	0.00000	0.00019	0.0000	0.0097
10	20	4.43	107.62	91.20	91.30	0.00000	0.00019	0.0000	0.0097
11	20	4.41	108.79	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 8 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	4.78	87.24	91.30	91.30	0.00000	0.00000	0.0000	0.0000
2	20	5.30	56.96	91.20	91.30	0.00000	0.00019	0.0000	0.0097
3	20	5.11	68.02	91.10	91.20	0.00019	0.00019	0.0097	0.0097
4	20	5.09	69.19	91.10	91.20	0.00019	0.00019	0.0097	0.0097
5	20	5.17	64.53	90.90	91.10	0.00039	0.00039	0.0194	0.0194
6	20	5.60	39.49	90.80	90.90	0.00078	0.00019	0.0389	0.0097
7	20	5.52	44.15	90.80	90.90	0.00078	0.00019	0.0389	0.0097
8	20	5.42	49.97	90.60	90.80	0.00097	0.00039	0.0486	0.0194
9	20	5.50	45.31	90.50	90.70	0.00117	0.00039	0.0583	0.0194
10	20	5.53	43.56	90.30	90.60	0.00136	0.00058	0.0681	0.0292
11	20	5.49	45.89	90.20	90.50	0.00156	0.00058	0.0778	0.0292
12	20	5.41	50.55	90.20	90.40	0.00175	0.00039	0.0875	0.0194
13	20	5.39	51.72	90.10	90.40	0.00175	0.00058	0.0875	0.0292
14	20	5.36	53.47	90.10	90.40	0.00175	0.00058	0.0875	0.0292
15	20	5.40	51.14	90.20	90.50	0.00156	0.00058	0.0778	0.0292
16	20	5.41	50.55	90.10	90.40	0.00175	0.00058	0.0875	0.0292
17	20	5.40	51.14	90.10	90.30	0.00194	0.00039	0.0972	0.0194
18	20	5.39	51.72	90.10	90.30	0.00194	0.00039	0.0972	0.0194
19	20	5.32	55.79	90.00	90.30	0.00194	0.00058	0.0972	0.0292
20	20	5.33	55.21	90.00	90.30	0.00194	0.00058	0.0972	0.0292
21	20	5.40	51.14	90.00	90.20	0.00214	0.00039	0.1069	0.0194
22	20	5.39	51.72	90.00	90.20	0.00214	0.00039	0.1069	0.0194
23	20	5.31	56.38	90.00	90.20	0.00214	0.00039	0.1069	0.0194
24	20	5.28	58.12	89.80	90.20	0.00214	0.00078	0.1069	0.0389
25	20	5.24	60.45	89.80	90.20	0.00214	0.00078	0.1069	0.0389
26	20	5.36	53.47	89.80	90.20	0.00214	0.00078	0.1069	0.0389
27	20	5.31	56.38	89.90	90.10	0.00233	0.00039	0.1167	0.0194
28	20	5.29	57.54	89.90	90.10	0.00233	0.00039	0.1167	0.0194
29	20	5.25	59.87	90.00	90.20	0.00214	0.00039	0.1069	0.0194

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 8 : (1 st REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.38	52.30	88.00	88.50	0.00544	0.00097	0.2722	0.0486
2	20	5.50	45.31	88.20	88.70	0.00506	0.00097	0.2528	0.0486
3	20	5.48	46.48	88.50	88.80	0.00486	0.00058	0.2430	0.0292
4	20	5.43	49.39	88.70	89.40	0.00369	0.00136	0.1847	0.0681
5	20	5.50	45.31	88.90	89.60	0.00331	0.00136	0.1653	0.0681
6	20	5.52	44.15	89.30	89.80	0.00292	0.00097	0.1458	0.0486
7	20	5.46	47.64	89.40	90.10	0.00233	0.00136	0.1167	0.0681
8	20	5.49	45.89	89.70	90.10	0.00233	0.00078	0.1167	0.0389
9	20	5.51	44.73	89.80	90.20	0.00214	0.00078	0.1069	0.0389
10	20	5.56	41.82	89.80	90.20	0.00214	0.00078	0.1069	0.0389
11	20	5.50	45.31	90.00	90.30	0.00194	0.00058	0.0972	0.0292
12	20	5.51	44.73	90.00	90.30	0.00194	0.00058	0.0972	0.0292
13	20	5.60	39.49	90.10	90.40	0.00175	0.00058	0.0875	0.0292
14	20	5.52	44.15	90.10	90.40	0.00175	0.00058	0.0875	0.0292
15	20	5.54	42.98	90.20	90.50	0.00156	0.00058	0.0778	0.0292
16	20	5.46	47.64	90.20	90.60	0.00136	0.00078	0.0681	0.0389
17	20	5.49	45.89	90.40	90.60	0.00136	0.00039	0.0681	0.0194
18	20	5.48	46.48	90.30	90.70	0.00117	0.00078	0.0583	0.0389
19	20	5.42	49.97	90.40	90.70	0.00117	0.00058	0.0583	0.0292
20	20	5.38	52.30	90.50	90.80	0.00097	0.00058	0.0486	0.0292
21	20	5.36	53.47	90.60	90.80	0.00097	0.00039	0.0486	0.0194
22	20	5.30	56.96	90.60	90.80	0.00097	0.00039	0.0486	0.0194
23	20	5.29	57.54	90.70	90.90	0.00078	0.00039	0.0389	0.0194
24	20	5.27	58.71	90.70	90.90	0.00078	0.00039	0.0389	0.0194

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 8 : (1 st REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
25	20	5.30	56.96	90.80	90.90	0.00078	0.00019	0.0389	0.0097
26	20	5.32	55.79	90.80	90.90	0.00078	0.00019	0.0389	0.0097
27	20	5.36	53.47	90.80	90.90	0.00078	0.00019	0.0389	0.0097
28	20	5.29	57.54	91.00	91.00	0.00058	0.00000	0.0292	0.0000
29	20	5.21	62.20	90.90	91.00	0.00058	0.00019	0.0292	0.0097
30	20	5.14	66.28	91.00	91.10	0.00039	0.00019	0.0194	0.0097
31	20	5.16	65.11	91.00	91.10	0.00039	0.00019	0.0194	0.0097
32	20	5.23	61.04	91.10	91.20	0.00019	0.00019	0.0097	0.0097
33	20	5.26	59.29	91.10	91.20	0.00019	0.00019	0.0097	0.0097
34	20	5.21	62.20	91.30	91.30	0.00000	0.00000	0.0000	0.0000
35	20	5.03	72.68	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 8 : (2nd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.74	31.34	88.80	88.90	0.02333	0.00097	0.2333	0.0097
2	100	5.29	57.54	89.50	89.60	0.01653	0.00097	0.1653	0.0097
3	100	5.06	70.94	88.80	90.00	0.01264	0.01167	0.1264	0.1167
4	100	4.86	82.58	90.10	90.40	0.00875	0.00292	0.0875	0.0292
5	100	4.75	88.99	91.00	91.20	0.00097	0.00194	0.0097	0.0194
6	20	4.73	90.15	91.10	91.20	0.00019	0.00019	0.0097	0.0097
7	20	4.69	92.48	91.20	91.20	0.00019	0.00000	0.0097	0.0000
8	20	4.70	91.90	91.20	91.30	0.00000	0.00019	0.0000	0.0097
9	20	4.68	93.07	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 100 mg./l. , pH 8 : (3rd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.40	51.14	90.00	90.10	0.01167	0.00097	0.1167	0.0097
2	100	5.12	67.44	90.70	90.80	0.00486	0.00097	0.0486	0.0097
3	100	4.63	95.98	91.20	91.30	0.00000	0.00097	0.0000	0.0097
4	20	4.58	98.89	91.20	91.30	0.00000	0.00019	0.0000	0.0097
5	20	4.57	99.47	91.20	91.30	0.00000	0.00019	0.0000	0.0097
6	20	4.55	100.64	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 4 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.04	72.10	86.70	87.30	0.00778	0.00117	0.3889	0.0583
2	20	5.01	73.85	87.10	87.50	0.00739	0.00078	0.3694	0.0389
3	20	4.99	75.01	87.00	87.40	0.00758	0.00078	0.3792	0.0389
4	20	4.95	77.34	87.00	87.50	0.00739	0.00097	0.3694	0.0486
5	20	4.88	81.42	87.20	87.60	0.00719	0.00078	0.3597	0.0389
6	20	4.84	83.75	87.40	87.80	0.00681	0.00078	0.3403	0.0389
7	20	4.79	86.66	87.30	87.70	0.00700	0.00078	0.3500	0.0389
8	20	4.72	90.74	87.50	87.80	0.00681	0.00058	0.3403	0.0292
9	20	4.69	92.48	87.50	87.90	0.00661	0.00078	0.3305	0.0389
10	20	4.67	93.65	87.80	88.10	0.00622	0.00058	0.3111	0.0292
11	20	4.64	95.39	87.80	88.10	0.00622	0.00058	0.3111	0.0292
12	20	4.63	95.98	88.00	88.20	0.00603	0.00039	0.3014	0.0194
13	20	4.61	97.14	88.00	88.20	0.00603	0.00039	0.3014	0.0194
14	20	4.60	97.72	88.10	88.30	0.00583	0.00039	0.2917	0.0194
15	20	4.59	98.31	88.10	88.30	0.00583	0.00039	0.2917	0.0194
16	100	4.62	96.56	88.20	88.50	0.02722	0.00292	0.2722	0.0292
17	100	4.63	95.98	88.50	88.70	0.02528	0.00194	0.2528	0.0194
18	100	4.65	94.81	88.50	88.90	0.02333	0.00389	0.2333	0.0389
19	100	4.66	94.23	88.60	90.00	0.01264	0.01361	0.1264	0.1361
20	100	4.70	91.90	88.80	90.10	0.01167	0.01264	0.1167	0.1264
21	100	4.72	90.74	90.00	90.30	0.00972	0.00292	0.0972	0.0292
22	100	4.75	88.99	90.20	90.50	0.00778	0.00292	0.0778	0.0292
23	100	4.79	86.66	90.30	90.50	0.00778	0.00194	0.0778	0.0194
24	100	4.80	86.08	90.40	90.60	0.00681	0.00194	0.0681	0.0194
25	100	4.81	85.49	90.50	90.70	0.00583	0.00194	0.0583	0.0194
26	100	4.83	84.33	90.60	90.80	0.00486	0.00194	0.0486	0.0194
27	100	4.86	82.58	90.60	90.80	0.00486	0.00194	0.0486	0.0194
28	100	4.88	81.42	90.80	90.90	0.00389	0.00097	0.0389	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 4 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
29	100	4.92	79.09	90.80	90.90	0.00389	0.00097	0.0389	0.0097
30	100	4.95	77.34	90.80	90.90	0.00389	0.00097	0.0389	0.0097
31	100	4.96	76.76	91.00	91.10	0.00194	0.00097	0.0194	0.0097
32	100	4.99	75.01	91.00	91.10	0.00194	0.00097	0.0194	0.0097
33	100	5.03	72.68	91.10	91.20	0.00097	0.00097	0.0097	0.0097
34	100	5.05	71.52	91.20	91.20	0.00097	0.00000	0.0097	0.0000
35	100	5.12	67.44	91.20	91.30	0.00000	0.00097	0.0000	0.0097
36	20	5.17	64.53	91.20	91.30	0.00000	0.00019	0.0000	0.0097
37	20	5.21	62.20	91.20	91.30	0.00000	0.00019	0.0000	0.0097
38	20	5.23	61.04	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 4 : (2 nd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.01	73.85	88.20	88.50	0.02722	0.00292	0.2722	0.0292
2	100	4.97	76.18	88.30	88.60	0.02625	0.00292	0.2625	0.0292
3	100	4.93	78.51	88.40	88.70	0.02528	0.00292	0.2528	0.0292
4	100	4.89	80.84	88.70	88.90	0.02333	0.00194	0.2333	0.0194
5	100	4.85	83.17	89.70	90.00	0.01264	0.00292	0.1264	0.0292
6	100	4.84	83.75	89.60	90.10	0.01167	0.00486	0.1167	0.0486
7	100	4.81	85.49	89.60	90.20	0.01069	0.00583	0.1069	0.0583
8	100	4.83	84.33	89.70	90.30	0.00972	0.00583	0.0972	0.0583
9	100	4.85	83.17	90.00	90.40	0.00875	0.00389	0.0875	0.0389
10	100	4.88	81.42	90.10	90.40	0.00875	0.00292	0.0875	0.0292
11	100	4.91	79.67	90.30	90.60	0.00681	0.00292	0.0681	0.0292
12	100	4.92	79.09	90.30	90.50	0.00778	0.00194	0.0778	0.0194
13	100	4.95	77.34	90.30	90.50	0.00778	0.00194	0.0778	0.0194
14	100	4.98	75.59	90.40	90.60	0.00681	0.00194	0.0681	0.0194
15	100	5.03	72.68	90.40	90.60	0.00681	0.00194	0.0681	0.0194
16	100	5.05	71.52	90.40	90.60	0.00681	0.00194	0.0681	0.0194
17	100	5.09	69.19	90.50	90.70	0.00583	0.00194	0.0583	0.0194
18	100	5.11	68.02	90.60	90.70	0.00583	0.00097	0.0583	0.0097
19	100	5.14	66.28	90.70	90.80	0.00486	0.00097	0.0486	0.0097
20	100	5.10	68.61	90.70	90.80	0.00486	0.00097	0.0486	0.0097
21	100	5.07	70.35	90.60	90.80	0.00486	0.00194	0.0486	0.0194
22	100	5.02	73.27	90.80	90.90	0.00389	0.00097	0.0389	0.0097
23	100	4.97	76.18	90.80	90.90	0.00389	0.00097	0.0389	0.0097
24	100	4.99	75.01	90.90	91.00	0.00292	0.00097	0.0292	0.0097
25	100	4.95	77.34	91.00	91.10	0.00194	0.00097	0.0194	0.0097
26	100	4.94	77.92	91.10	91.20	0.00097	0.00097	0.0097	0.0097
27	100	4.91	79.67	91.20	91.20	0.00097	0.00000	0.0097	0.0000
28	100	4.86	82.58	91.20	91.30	0.00000	0.00097	0.0000	0.0097
29	20	4.82	84.91	91.20	91.30	0.00000	0.00019	0.0000	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 4 : (2nd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
30	20	4.80	86.08	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 4 : (3 rd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.46	105.88	88.50	88.80	0.02430	0.00292	0.2430	0.0292
2	100	4.41	108.79	88.40	89.00	0.02236	0.00583	0.2236	0.0583
3	100	4.36	111.70	88.40	89.10	0.02139	0.00681	0.2139	0.0681
4	100	4.38	110.54	88.70	89.20	0.02042	0.00486	0.2042	0.0486
5	100	4.33	113.45	89.00	89.30	0.01944	0.00292	0.1944	0.0292
6	100	4.28	116.36	89.10	89.40	0.01847	0.00292	0.1847	0.0292
7	100	4.30	115.20	89.30	89.50	0.01750	0.00194	0.1750	0.0194
8	100	4.31	114.61	89.40	89.60	0.01653	0.00194	0.1653	0.0194
9	100	4.34	112.87	89.40	89.60	0.01653	0.00194	0.1653	0.0194
10	100	4.33	113.45	89.50	89.70	0.01556	0.00194	0.1556	0.0194
11	100	4.36	111.70	89.60	89.80	0.01458	0.00194	0.1458	0.0194
12	100	4.40	109.37	89.80	89.90	0.01361	0.00097	0.1361	0.0097
13	100	4.38	110.54	90.00	90.10	0.01167	0.00097	0.1167	0.0097
14	100	4.35	112.28	90.00	90.10	0.01167	0.00097	0.1167	0.0097
15	100	4.32	114.03	90.00	90.20	0.01069	0.00194	0.1069	0.0194
16	100	4.34	112.87	90.20	90.30	0.00972	0.00097	0.0972	0.0097
17	100	4.36	111.70	90.20	90.30	0.00972	0.00097	0.0972	0.0097
18	100	4.37	111.12	90.30	90.40	0.00875	0.00097	0.0875	0.0097
19	100	4.40	109.37	90.30	90.50	0.00778	0.00194	0.0778	0.0194
20	100	4.39	109.95	90.50	90.60	0.00681	0.00097	0.0681	0.0097
21	100	4.41	108.79	90.50	90.60	0.00681	0.00097	0.0681	0.0097
22	100	4.44	107.04	90.50	90.70	0.00583	0.00194	0.0583	0.0194
23	100	4.43	107.62	90.60	90.80	0.00486	0.00194	0.0486	0.0194
24	100	4.40	109.37	90.60	90.70	0.00583	0.00097	0.0583	0.0097
25	100	4.42	108.21	90.70	90.80	0.00486	0.00097	0.0486	0.0097
26	100	4.45	106.46	90.70	90.80	0.00486	0.00097	0.0486	0.0097
27	100	4.48	104.71	90.80	90.90	0.00389	0.00097	0.0389	0.0097
28	100	4.49	104.13	90.90	91.00	0.00292	0.00097	0.0292	0.0097
29	100	4.52	102.38	90.90	91.00	0.00292	0.00097	0.0292	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 4 : (3rd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
30	100	4.50	103.55	91.00	91.10	0.00194	0.00097	0.0194	0.0097
31	100	4.55	100.64	91.10	91.20	0.00097	0.00097	0.0097	0.0097
32	100	4.59	98.31	91.20	91.20	0.00097	0.00000	0.0097	0.0000
33	20	4.56	100.05	91.20	91.30	0.00000	0.00019	0.0000	0.0097
34	20	4.58	98.89	91.20	91.30	0.00000	0.00019	0.0000	0.0097
35	20	4.57	99.47	91.20	91.30	0.00000	0.00019	0.0000	0.0097
36	20	4.60	97.72	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 4 : (4 th REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.35	112.28	87.10	87.30	0.03889	0.00194	0.3889	0.0194
2	100	4.31	114.61	87.60	87.80	0.03403	0.00194	0.3403	0.0194
3	100	4.29	115.78	88.00	88.20	0.03014	0.00194	0.3014	0.0194
4	100	4.30	115.20	88.10	88.60	0.02625	0.00486	0.2625	0.0486
5	100	4.33	113.45	88.80	89.00	0.02236	0.00194	0.2236	0.0194
6	100	4.34	112.87	89.00	89.30	0.01944	0.00292	0.1944	0.0292
7	100	4.38	110.54	89.40	89.60	0.01653	0.00194	0.1653	0.0194
8	100	4.35	112.28	89.70	89.80	0.01458	0.00097	0.1458	0.0097
9	100	4.37	111.12	89.80	90.00	0.01264	0.00194	0.1264	0.0194
10	100	4.36	111.70	90.00	90.10	0.01167	0.00097	0.1167	0.0097
11	100	4.33	113.45	90.30	90.40	0.00875	0.00097	0.0875	0.0097
12	100	4.29	115.78	90.30	90.60	0.00681	0.00292	0.0681	0.0292
13	100	4.30	115.20	90.50	90.70	0.00583	0.00194	0.0583	0.0194
14	100	4.26	117.52	90.70	90.80	0.00486	0.00097	0.0486	0.0097
15	100	4.21	120.44	90.90	91.00	0.00292	0.00097	0.0292	0.0097
16	100	4.22	119.85	91.20	91.20	0.00097	0.00000	0.0097	0.0000
17	20	4.25	118.11	91.20	91.30	0.00000	0.00019	0.0000	0.0097
18	20	4.23	119.27	91.20	91.30	0.00000	0.00019	0.0000	0.0097
19	20	4.24	118.69	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 6 : (1 st REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	5.25	59.87	88.20	88.50	0.00544	0.00058	0.2722	0.0292
2	20	5.26	59.29	88.30	88.70	0.00506	0.00078	0.2528	0.0389
3	20	5.29	57.54	88.40	88.80	0.00486	0.00078	0.2430	0.0389
4	20	5.34	54.63	88.40	89.00	0.00447	0.00117	0.2236	0.0583
5	20	5.37	52.88	88.50	89.10	0.00428	0.00117	0.2139	0.0583
6	20	5.41	50.55	88.90	89.30	0.00389	0.00078	0.1944	0.0389
7	20	5.43	49.39	89.00	89.40	0.00369	0.00078	0.1847	0.0389
8	20	5.42	49.97	89.20	89.50	0.00350	0.00058	0.1750	0.0292
9	20	5.44	48.81	89.30	89.60	0.00331	0.00058	0.1653	0.0292
10	20	5.47	47.06	89.30	89.60	0.00331	0.00058	0.1653	0.0292
11	20	5.50	45.31	89.40	89.70	0.00311	0.00058	0.1556	0.0292
12	20	5.52	44.15	89.60	89.80	0.00292	0.00039	0.1458	0.0194
13	20	5.55	42.40	89.50	89.80	0.00292	0.00058	0.1458	0.0292
14	20	5.59	40.07	89.60	89.90	0.00272	0.00058	0.1361	0.0292
15	20	5.62	38.32	89.80	90.00	0.00253	0.00039	0.1264	0.0194
16	100	5.66	35.99	89.80	90.00	0.01264	0.00194	0.1264	0.0194
17	100	5.64	37.16	89.90	90.10	0.01167	0.00194	0.1167	0.0194
18	100	5.63	37.74	90.00	90.20	0.01069	0.00194	0.1069	0.0194
19	100	5.61	38.91	90.20	90.30	0.00972	0.00097	0.0972	0.0097
20	100	5.56	41.82	90.20	90.30	0.00972	0.00097	0.0972	0.0097
21	100	5.48	46.48	90.30	90.40	0.00875	0.00097	0.0875	0.0097
22	100	5.42	49.97	90.30	90.50	0.00778	0.00194	0.0778	0.0194
23	100	5.39	51.72	90.60	90.70	0.00583	0.00097	0.0583	0.0097
24	100	5.36	53.47	90.70	90.80	0.00486	0.00097	0.0486	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 6 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
25	100	5.32	55.79	90.80	90.90	0.00389	0.00097	0.0389	0.0097
26	100	5.31	56.38	90.80	90.90	0.00389	0.00097	0.0389	0.0097
27	100	5.28	58.12	90.90	91.00	0.00292	0.00097	0.0292	0.0097
28	100	5.29	57.54	90.80	91.00	0.00292	0.00194	0.0292	0.0194
29	100	5.26	59.29	90.90	91.10	0.00194	0.00194	0.0194	0.0194
30	100	5.23	61.04	91.10	91.20	0.00097	0.00097	0.0097	0.0097
31	100	5.21	62.20	91.10	91.20	0.00097	0.00097	0.0097	0.0097
32	100	5.18	63.95	91.20	91.20	0.00097	0.00000	0.0097	0.0000
33	100	5.19	63.37	91.20	91.30	0.00000	0.00097	0.0000	0.0097
34	20	5.17	64.53	91.20	91.30	0.00000	0.00019	0.0000	0.0097
35	20	5.13	66.86	91.20	91.30	0.00000	0.00019	0.0000	0.0097
36	20	5.11	68.02	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 6 : (2nd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.37	52.88	88.60	88.70	0.02528	0.00097	0.2528	0.0097
2	100	5.34	54.63	88.60	88.90	0.02333	0.00292	0.2333	0.0292
3	100	5.32	55.79	88.80	89.00	0.02236	0.00194	0.2236	0.0194
4	100	5.26	59.29	88.80	89.20	0.02042	0.00389	0.2042	0.0389
5	100	5.22	61.62	88.80	89.30	0.01944	0.00486	0.1944	0.0486
6	100	5.27	58.71	89.10	89.50	0.01750	0.00389	0.1750	0.0389
7	100	5.33	55.21	89.20	89.60	0.01653	0.00389	0.1653	0.0389
8	100	5.36	53.47	89.30	89.70	0.01556	0.00389	0.1556	0.0389
9	100	5.35	54.05	89.60	89.90	0.01361	0.00292	0.1361	0.0292
10	100	5.39	51.72	89.80	90.00	0.01264	0.00194	0.1264	0.0194
11	100	5.38	52.30	89.80	90.10	0.01167	0.00292	0.1167	0.0292
12	100	5.34	54.63	89.90	90.20	0.01069	0.00292	0.1069	0.0292
13	100	5.30	56.96	90.10	90.30	0.00972	0.00194	0.0972	0.0194
14	100	5.29	57.54	90.30	90.40	0.00875	0.00097	0.0875	0.0097
15	100	5.31	56.38	90.20	90.40	0.00875	0.00194	0.0875	0.0194
16	100	5.28	58.12	90.50	90.60	0.00681	0.00097	0.0681	0.0097
17	100	5.25	59.87	90.60	90.70	0.00583	0.00097	0.0583	0.0097
18	100	5.21	62.20	90.70	90.80	0.00486	0.00097	0.0486	0.0097
19	100	5.27	58.71	90.80	90.90	0.00389	0.00097	0.0389	0.0097
20	100	5.26	59.29	90.80	90.90	0.00389	0.00097	0.0389	0.0097
21	100	5.24	60.45	90.90	91.00	0.00292	0.00097	0.0292	0.0097
22	100	5.20	62.78	91.10	91.10	0.00194	0.00000	0.0194	0.0000
23	100	5.19	63.37	91.10	91.20	0.00097	0.00097	0.0097	0.0097
24	100	5.15	65.69	91.20	91.20	0.00097	0.00000	0.0097	0.0000
25	20	5.13	66.86	91.20	91.30	0.00000	0.00019	0.0000	0.0097
26	20	5.14	66.28	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 6 : (3 rd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.38	52.30	88.60	88.70	0.02528	0.00097	0.2528	0.0097
2	100	5.34	54.63	88.70	88.90	0.02333	0.00194	0.2333	0.0194
3	100	5.31	56.38	88.60	88.90	0.02333	0.00292	0.2333	0.0292
4	100	5.28	58.12	88.80	89.10	0.02139	0.00292	0.2139	0.0292
5	100	5.26	59.29	88.90	89.20	0.02042	0.00292	0.2042	0.0292
6	100	5.21	62.20	89.10	89.40	0.01847	0.00292	0.1847	0.0292
7	100	5.16	65.11	89.20	89.50	0.01750	0.00292	0.1750	0.0292
8	100	5.22	61.62	89.30	89.60	0.01653	0.00292	0.1653	0.0292
9	100	5.25	59.87	89.10	89.60	0.01653	0.00486	0.1653	0.0486
10	100	5.29	57.54	89.10	89.70	0.01556	0.00583	0.1556	0.0583
11	100	5.33	55.21	89.20	89.80	0.01458	0.00583	0.1458	0.0583
12	100	5.24	60.45	89.50	90.10	0.01167	0.00583	0.1167	0.0583
13	100	5.17	64.53	89.80	90.20	0.01069	0.00389	0.1069	0.0389
14	100	5.04	72.10	89.90	90.20	0.01069	0.00292	0.1069	0.0292
15	100	5.01	73.85	90.10	90.30	0.00972	0.00194	0.0972	0.0194
16	100	4.95	77.34	90.10	90.30	0.00972	0.00194	0.0972	0.0194
17	100	4.98	75.59	90.40	90.50	0.00778	0.00097	0.0778	0.0097
18	100	4.91	79.67	90.40	90.50	0.00778	0.00097	0.0778	0.0097
19	100	4.86	82.58	90.50	90.60	0.00681	0.00097	0.0681	0.0097
20	100	4.84	83.75	90.50	90.60	0.00681	0.00097	0.0681	0.0097
21	100	4.80	86.08	90.50	90.60	0.00681	0.00097	0.0681	0.0097
22	100	4.81	85.49	90.70	90.70	0.00583	0.00000	0.0583	0.0000
23	100	4.77	87.82	90.70	90.80	0.00486	0.00097	0.0486	0.0097
24	100	4.75	88.99	90.70	90.80	0.00486	0.00097	0.0486	0.0097
25	100	4.82	84.91	90.80	90.90	0.00389	0.00097	0.0389	0.0097
26	100	4.79	86.66	90.80	90.90	0.00389	0.00097	0.0389	0.0097

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 6 : (3rd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
27	100	4.72	90.74	90.90	91.00	0.00292	0.00097	0.0292	0.0097
28	100	4.70	91.90	91.00	91.00	0.00292	0.00000	0.0292	0.0000
29	100	4.66	94.23	91.00	91.10	0.00194	0.00097	0.0194	0.0097
30	100	4.65	94.81	91.10	91.10	0.00194	0.00000	0.0194	0.0000
31	100	4.62	96.56	91.10	91.20	0.00097	0.00097	0.0097	0.0097
32	100	4.61	97.14	91.20	91.20	0.00097	0.00000	0.0097	0.0000
33	100	4.58	98.89	91.20	91.30	0.00000	0.00097	0.0000	0.0097
34	20	4.56	100.05	91.20	91.30	0.00000	0.00019	0.0000	0.0097
35	20	4.54	101.22	91.20	91.30	0.00000	0.00019	0.0000	0.0097
36	20	4.55	100.64	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 8 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	6.07	12.12	88.10	88.20	0.00603	0.00019	0.3014	0.0097
2	20	6.06	12.70	88.00	88.20	0.00603	0.00039	0.3014	0.0194
3	20	6.02	15.03	88.00	88.30	0.00583	0.00058	0.2917	0.0292
4	20	6.04	13.86	88.00	88.30	0.00583	0.00058	0.2917	0.0292
5	20	6.05	13.28	88.10	88.30	0.00583	0.00039	0.2917	0.0194
6	20	6.01	15.61	88.10	88.40	0.00564	0.00058	0.2819	0.0292
7	20	5.96	18.52	88.20	88.40	0.00564	0.00039	0.2819	0.0194
8	20	5.95	19.11	88.20	88.50	0.00544	0.00058	0.2722	0.0292
9	20	5.87	23.76	88.20	88.60	0.00525	0.00078	0.2625	0.0389
10	20	5.82	26.68	88.30	88.70	0.00506	0.00078	0.2528	0.0389
11	20	5.75	30.75	88.20	88.80	0.00486	0.00117	0.2430	0.0583
12	20	5.81	27.26	88.40	88.80	0.00486	0.00078	0.2430	0.0389
13	20	5.88	23.18	88.80	89.00	0.00447	0.00039	0.2236	0.0194
14	20	5.93	20.27	88.80	89.10	0.00428	0.00058	0.2139	0.0292
15	20	6.00	16.19	88.80	89.10	0.00428	0.00058	0.2139	0.0292
16	20	5.98	17.36	89.00	89.20	0.00408	0.00039	0.2042	0.0194
17	20	6.03	14.45	89.00	89.20	0.00408	0.00039	0.2042	0.0194
18	20	5.99	16.78	89.10	89.30	0.00389	0.00039	0.1944	0.0194
19	20	5.56	41.82	89.30	89.50	0.00350	0.00039	0.1750	0.0194
20	20	5.95	19.11	89.40	89.60	0.00331	0.00039	0.1653	0.0194
21	20	5.92	20.85	89.40	89.60	0.00331	0.00039	0.1653	0.0194
22	20	5.88	23.18	89.50	89.70	0.00311	0.00039	0.1556	0.0194
23	20	5.87	23.76	89.50	89.70	0.00311	0.00039	0.1556	0.0194
24	20	5.84	25.51	89.40	89.80	0.00292	0.00078	0.1458	0.0389
25	20	5.83	26.09	89.60	89.80	0.00292	0.00039	0.1458	0.0194
26	20	5.81	27.26	89.60	89.80	0.00292	0.00039	0.1458	0.0194
27	20	5.77	29.59	89.70	89.90	0.00272	0.00039	0.1361	0.0194
28	20	5.75	30.75	89.70	89.90	0.00272	0.00039	0.1361	0.0194

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 8 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
29	20	5.74	31.34	89.80	90.00	0.00253	0.00039	0.1264	0.0194
30	20	5.72	32.50	89.90	90.00	0.00253	0.00019	0.1264	0.0097
31	100	5.67	35.41	90.20	90.30	0.00972	0.00097	0.0972	0.0097
32	100	5.61	38.91	90.30	90.50	0.00778	0.00194	0.0778	0.0194
33	100	5.57	41.24	90.30	90.50	0.00778	0.00194	0.0778	0.0194
34	100	5.44	48.81	90.70	90.80	0.00486	0.00097	0.0486	0.0097
35	100	5.36	53.47	90.80	90.90	0.00389	0.00097	0.0389	0.0097
36	100	5.19	63.37	91.20	91.20	0.00097	0.00000	0.0097	0.0000
37	100	5.17	64.53	91.20	91.30	0.00000	0.00097	0.0000	0.0097
38	20	5.16	65.11	91.30	91.30	0.00000	0.00000	0.0000	0.0000

SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 8 : (2 nd RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	20	6.35	-4.19	89.50	89.60	0.00331	0.00019	0.1653	0.0097
2	20	6.87	-34.47	89.10	89.20	0.00408	0.00019	0.2042	0.0097
3	20	7.05	-44.95	88.80	88.90	0.00467	0.00019	0.2333	0.0097
4	20	7.24	-56.02	86.50	86.60	0.00914	0.00019	0.4569	0.0097
	Regen. 2 nd								



SYNTHETIC WASTEWATER : INFLUENT CROMIUM(VI) = 200 mg./l. , pH 8 : (2nd REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	6.35	-4.19	88.20	88.30	0.02917	0.00097	0.2917	0.0097
2	100	5.76	30.17	89.30	89.40	0.01847	0.00097	0.1847	0.0097
3	100	5.11	68.02	90.60	90.70	0.00583	0.00097	0.0583	0.0097
4	100	4.87	82.00	91.20	91.30	0.00000	0.00097	0.0000	0.0097
5	20	4.85	83.17	91.20	91.30	0.00000	0.00019	0.0000	0.0097
6	20	4.80	86.08	91.20	91.30	0.00000	0.00019	0.0000	0.0097
7	20	4.77	87.82	91.30	91.30	0.00000	0.00000	0.0000	0.0000

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.02	73.27	91.00	91.10	0.00194	0.00097	0.0194	0.0097
2	100	5.03	72.68	91.10	91.10	0.00194	0.00000	0.0194	0.0000
3	100	5.05	71.52	90.50	90.90	0.00389	0.00389	0.0389	0.0389
4	100	5.06	70.94	91.10	91.10	0.00194	0.00000	0.0194	0.0000
5	100	5.09	69.19	91.10	91.10	0.00194	0.00000	0.0194	0.0000
6	100	5.10	68.61	90.90	91.00	0.00292	0.00097	0.0292	0.0097
7	100	5.12	67.44	91.00	91.10	0.00194	0.00097	0.0194	0.0097
8	100	5.13	66.86	91.00	91.10	0.00194	0.00097	0.0194	0.0097
9	100	5.16	65.11	90.90	91.00	0.00292	0.00097	0.0292	0.0097
10	100	5.18	63.95	90.80	91.00	0.00292	0.00194	0.0292	0.0194
11	100	5.19	63.37	90.80	91.00	0.00292	0.00194	0.0292	0.0194
12	100	5.22	61.62	90.80	91.00	0.00292	0.00194	0.0292	0.0194
13	100	5.21	62.20	90.80	90.90	0.00389	0.00097	0.0389	0.0097
14	100	5.20	62.78	90.70	90.90	0.00389	0.00194	0.0389	0.0194
15	100	5.23	61.04	90.70	90.90	0.00389	0.00194	0.0389	0.0194
16	100	5.24	60.45	90.70	90.90	0.00389	0.00194	0.0389	0.0194
17	100	5.27	58.71	90.70	90.90	0.00389	0.00194	0.0389	0.0194
18	100	5.31	56.38	90.60	90.80	0.00486	0.00194	0.0486	0.0194
19	100	5.33	55.21	90.60	90.80	0.00486	0.00194	0.0486	0.0194
20	100	5.34	54.63	90.60	90.80	0.00486	0.00194	0.0486	0.0194
21	100	5.35	54.05	90.60	90.80	0.00486	0.00194	0.0486	0.0194
22	100	5.36	53.47	90.60	90.80	0.00486	0.00194	0.0486	0.0194
23	100	5.39	51.72	90.60	90.80	0.00486	0.00194	0.0486	0.0194
24	100	5.40	51.14	90.50	90.70	0.00583	0.00194	0.0583	0.0194
25	100	5.42	49.97	90.50	90.80	0.00486	0.00292	0.0486	0.0292
26	100	5.41	50.55	90.50	90.70	0.00583	0.00194	0.0583	0.0194
27	100	5.43	49.39	90.50	90.70	0.00583	0.00194	0.0583	0.0194
28	100	5.45	48.22	90.40	90.70	0.00583	0.00292	0.0583	0.0292
29	100	5.47	47.06	90.40	90.70	0.00583	0.00292	0.0583	0.0292
30	100	5.48	46.48	90.40	90.70	0.00583	0.00292	0.0583	0.0292

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (1 st RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
31	100	5.50	45.31	90.30	90.60	0.00681	0.00292	0.0681	0.0292
32	100	5.51	44.73	90.30	90.70	0.00583	0.00389	0.0583	0.0389
33	100	5.53	43.56	90.30	90.60	0.00681	0.00292	0.0681	0.0292
34	100	5.55	42.40	90.20	90.60	0.00681	0.00389	0.0681	0.0389
35	100	5.54	42.98	90.20	90.60	0.00681	0.00389	0.0681	0.0389
36	100	5.52	44.15	90.20	90.50	0.00778	0.00292	0.0778	0.0292
37	100	5.50	45.31	90.30	90.50	0.00778	0.00194	0.0778	0.0194
38	100	5.51	44.73	90.30	90.50	0.00778	0.00194	0.0778	0.0194
39	100	5.49	45.89	90.20	90.50	0.00778	0.00292	0.0778	0.0292
40	100	5.48	46.48	90.20	90.40	0.00875	0.00194	0.0875	0.0194
41	100	5.47	47.06	90.10	90.40	0.00875	0.00292	0.0875	0.0292
42	100	5.45	48.22	90.10	90.40	0.00875	0.00292	0.0875	0.0292
43	100	5.46	47.64	90.10	90.40	0.00875	0.00292	0.0875	0.0292
44	100	5.50	45.31	90.00	90.30	0.00972	0.00292	0.0972	0.0292
45	100	5.51	44.73	90.00	90.30	0.00972	0.00292	0.0972	0.0292
46	100	5.54	42.98	90.00	90.30	0.00972	0.00292	0.0972	0.0292
47	100	5.55	42.40	89.90	90.30	0.00972	0.00389	0.0972	0.0389
48	100	5.57	41.24	89.80	90.20	0.01069	0.00389	0.1069	0.0389
49	100	5.52	44.15	89.80	90.20	0.01069	0.00389	0.1069	0.0389
50	100	5.53	43.56	89.70	90.10	0.01167	0.00389	0.1167	0.0389
51	100	5.51	44.73	89.60	90.10	0.01167	0.00486	0.1167	0.0486
52	100	5.49	45.89	89.60	90.10	0.01167	0.00486	0.1167	0.0486
53	100	5.48	46.48	89.50	90.10	0.01167	0.00583	0.1167	0.0583
54	100	5.50	45.31	89.50	90.00	0.01264	0.00486	0.1264	0.0486
55	100	5.52	44.15	89.50	90.00	0.01264	0.00486	0.1264	0.0486
56	100	5.49	45.89	89.40	90.00	0.01264	0.00583	0.1264	0.0583
57	100	5.47	47.06	89.40	89.90	0.01361	0.00486	0.1361	0.0486
58	100	5.45	48.22	89.40	90.00	0.01264	0.00583	0.1264	0.0583
59	100	5.46	47.64	89.30	89.90	0.01361	0.00583	0.1361	0.0583
60	100	5.44	48.81	89.30	89.90	0.01361	0.00583	0.1361	0.0583

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (1st REGENERATE)

FLOWRATE : 60 ml./hr.

MEDIA : MAGNETITE COATED-SAND

Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.

SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.93	78.51	88.50	89.00	0.02236	0.00486	0.2236	0.0486
2	100	4.89	80.84	88.60	89.10	0.02139	0.00486	0.2139	0.0486
3	100	4.84	83.75	88.60	89.30	0.01944	0.00681	0.1944	0.0681
4	100	4.81	85.49	89.00	89.40	0.01847	0.00389	0.1847	0.0389
5	100	4.79	86.66	89.00	89.50	0.01750	0.00486	0.1750	0.0486
6	100	4.78	87.24	89.20	89.70	0.01556	0.00486	0.1556	0.0486
7	100	4.77	87.82	89.20	89.80	0.01458	0.00583	0.1458	0.0583
8	100	4.75	88.99	89.50	89.90	0.01361	0.00389	0.1361	0.0389
9	100	4.74	89.57	89.70	90.10	0.01167	0.00389	0.1167	0.0389
10	100	4.73	90.15	89.90	90.20	0.01069	0.00292	0.1069	0.0292
11	100	4.71	91.32	89.90	90.20	0.01069	0.00292	0.1069	0.0292
12	100	4.70	91.90	89.90	90.30	0.00972	0.00389	0.0972	0.0389
13	100	4.68	93.07	90.00	90.40	0.00875	0.00389	0.0875	0.0389
14	100	4.66	94.23	90.20	90.60	0.00681	0.00389	0.0681	0.0389
15	100	4.65	94.81	90.20	90.70	0.00583	0.00486	0.0583	0.0486
16	100	4.64	95.39	90.30	90.80	0.00486	0.00486	0.0486	0.0486
17	100	4.61	97.14	90.40	90.80	0.00486	0.00389	0.0486	0.0389
18	100	4.60	97.72	90.50	90.90	0.00389	0.00389	0.0389	0.0389
19	100	4.57	99.47	90.50	91.00	0.00292	0.00486	0.0292	0.0486
20	100	4.54	101.22	90.60	91.10	0.00194	0.00486	0.0194	0.0486
21	100	4.53	101.80	90.90	91.10	0.00194	0.00194	0.0194	0.0194
22	100	4.51	102.97	91.10	91.20	0.00097	0.00097	0.0097	0.0097
23	100	4.50	103.55	91.20	91.20	0.00097	0.00000	0.0097	0.0000

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (2 nd RUN)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.09	69.19	91.00	91.10	0.00194	0.00097	0.0194	0.0097
2	100	5.12	67.44	90.90	91.00	0.00292	0.00097	0.0292	0.0097
3	100	5.15	65.69	90.90	91.00	0.00292	0.00097	0.0292	0.0097
4	100	5.16	65.11	90.80	90.90	0.00389	0.00097	0.0389	0.0097
5	100	5.18	63.95	90.80	90.90	0.00389	0.00097	0.0389	0.0097
6	100	5.20	62.78	90.80	90.90	0.00389	0.00097	0.0389	0.0097
7	100	5.19	63.37	90.70	90.80	0.00486	0.00097	0.0486	0.0097
8	100	5.21	62.20	90.70	90.80	0.00486	0.00097	0.0486	0.0097
9	100	5.22	61.62	90.60	90.70	0.00583	0.00097	0.0583	0.0097
10	100	5.24	60.45	90.50	90.70	0.00583	0.00194	0.0583	0.0194
11	100	5.25	59.87	90.40	90.60	0.00681	0.00194	0.0681	0.0194
12	100	5.27	58.71	90.40	90.60	0.00681	0.00194	0.0681	0.0194
13	100	5.29	57.54	90.30	90.60	0.00681	0.00292	0.0681	0.0292
14	100	5.32	55.79	90.30	90.50	0.00778	0.00194	0.0778	0.0194
15	100	5.31	56.38	90.30	90.50	0.00778	0.00194	0.0778	0.0194
16	100	5.30	56.96	90.10	90.40	0.00875	0.00292	0.0875	0.0292
17	100	5.33	55.21	90.10	90.30	0.00972	0.00194	0.0972	0.0194
18	100	5.34	54.63	90.00	90.20	0.01069	0.00194	0.1069	0.0194
19	100	5.35	54.05	90.00	90.20	0.01069	0.00194	0.1069	0.0194
20	100	5.37	52.88	89.80	90.10	0.01167	0.00292	0.1167	0.0292
21	100	5.39	51.72	89.80	90.00	0.01264	0.00194	0.1264	0.0194
22	100	5.40	51.14	89.70	90.00	0.01264	0.00292	0.1264	0.0292
23	100	5.43	49.39	89.60	89.90	0.01361	0.00292	0.1361	0.0292
24	100	5.45	48.22	89.60	89.80	0.01458	0.00194	0.1458	0.0194
25	100	5.44	48.81	89.60	89.80	0.01458	0.00194	0.1458	0.0194
26	100	5.41	50.55	89.50	89.70	0.01556	0.00194	0.1556	0.0194
27	100	5.47	47.06	89.40	89.60	0.01653	0.00194	0.1653	0.0194
28	100	5.49	45.89	89.40	89.60	0.01653	0.00194	0.1653	0.0194
29	100	5.50	45.31	89.40	89.50	0.01750	0.00097	0.1750	0.0097
30	100	5.53	43.56	89.20	89.40	0.01847	0.00194	0.1847	0.0194

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (2 nd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.89	80.84	88.50	88.80	0.02430	0.00292	0.2430	0.0292
2	100	4.86	82.58	88.70	89.10	0.02139	0.00389	0.2139	0.0389
3	100	4.84	83.75	88.70	89.20	0.02042	0.00486	0.2042	0.0486
4	100	4.81	85.49	88.90	89.40	0.01847	0.00486	0.1847	0.0486
5	100	4.8	86.08	89.20	89.60	0.01653	0.00389	0.1653	0.0389
6	100	4.78	87.24	89.30	89.70	0.01556	0.00389	0.1556	0.0389
7	100	4.77	87.82	89.30	89.80	0.01458	0.00486	0.1458	0.0486
8	100	4.75	88.99	89.70	90.00	0.01264	0.00292	0.1264	0.0292
9	100	4.72	90.74	89.80	90.20	0.01069	0.00389	0.1069	0.0389
10	100	4.7	91.90	90.20	90.50	0.00778	0.00292	0.0778	0.0292
11	100	4.71	91.32	90.30	90.70	0.00583	0.00389	0.0583	0.0389
12	100	4.68	93.07	90.50	90.90	0.00389	0.00389	0.0389	0.0389
13	100	4.65	94.81	90.90	91.00	0.00292	0.00097	0.0292	0.0097
14	100	4.62	96.56	91.20	91.20	0.00097	0.00000	0.0097	0.0000
15	100	4.6	97.72	91.20	91.20	0.00097	0.00000	0.0097	0.0000

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (3 rd REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	5.01	73.85	88.60	89.00	0.02236	0.00389	0.2236	0.0389
2	100	4.97	76.18	88.80	89.30	0.01944	0.00486	0.1944	0.0486
3	100	4.95	77.34	89.30	89.70	0.01556	0.00389	0.1556	0.0389
4	100	4.94	77.92	89.80	90.20	0.01069	0.00389	0.1069	0.0389
5	100	4.91	79.67	90.00	90.40	0.00875	0.00389	0.0875	0.0389
6	100	4.87	82.00	90.20	90.50	0.00778	0.00292	0.0778	0.0292
7	100	4.85	83.17	90.30	90.60	0.00681	0.00292	0.0681	0.0292
8	100	4.83	84.33	90.70	90.90	0.00389	0.00194	0.0389	0.0194
9	100	4.82	84.91	91.00	91.10	0.00194	0.00097	0.0194	0.0097
10	100	4.79	86.66	91.20	91.20	0.00097	0.00000	0.0097	0.0000

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (4 th REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.97	76.18	88.50	88.90	0.02333	0.00389	0.2333	0.0389
2	100	4.94	77.92	88.70	89.30	0.01944	0.00583	0.1944	0.0583
3	100	4.92	79.09	89.20	89.60	0.01653	0.00389	0.1653	0.0389
4	100	4.88	81.42	89.40	89.80	0.01458	0.00389	0.1458	0.0389
5	100	4.86	82.58	89.80	90.20	0.01069	0.00389	0.1069	0.0389
6	100	4.85	83.17	90.20	90.50	0.00778	0.00292	0.0778	0.0292
7	100	4.82	84.91	90.50	90.80	0.00486	0.00292	0.0486	0.0292
8	20	4.8	86.08	90.80	91.00	0.00058	0.00039	0.0292	0.0194
9	20	4.79	86.66	90.90	91.00	0.00058	0.00019	0.0292	0.0097
10	20	4.78	87.24	91.20	91.20	0.00019	0.00000	0.0097	0.0000
11	20	4.76	88.41	91.20	91.20	0.00019	0.00000	0.0097	0.0000

RAW WASTEWATER : INFLUENT CROMIUM(VI) = 8 mg./l. , pH 5.5 : (5 th REGENERATE)									
FLOWRATE : 60 ml./hr.									
MEDIA : MAGNETITE COATED-SAND									
Service after regenerated with sulfuric acid solution pH 4 flowrate 100 ml./hr.									
SAMPLE No.	Volume (ml.)	pH	ORP(mV.)	%T _{Total}	%T _{Cr⁶⁺}	Cr ⁶⁺ (mg.)	Cr ³⁺ (mg.)	Cr ⁶⁺ (mg./l.)	Cr ³⁺ (mg./l.)
1	100	4.86	82.58	89.00	89.40	0.01847	0.00389	0.1847	0.0389
2	100	4.83	84.33	89.40	89.90	0.01361	0.00486	0.1361	0.0486
3	100	4.79	86.66	90.00	90.30	0.00972	0.00292	0.0972	0.0292
4	100	4.77	87.82	90.50	90.70	0.00583	0.00194	0.0583	0.0194
5	20	4.76	88.41	90.80	91.20	0.00019	0.00078	0.0097	0.0389
6	20	4.74	89.57	91.20	91.30	0.00000	0.00019	0.0000	0.0097
7	20	4.72	90.74	91.30	91.30	0.00000	0.00000	0.0000	0.0000

ประวัติผู้เขียน

นายอดิศักดิ์ ปิยสถิตย์ เกิดเมื่อวันที่ 19 พฤษภาคม 2517 ณ จังหวัดพิษณุโลก สำเร็จการศึกษาระดับมัธยมศึกษาตอนปลาย โรงเรียนพิษณุโลกศึกษา ในปีการศึกษา 2535 สำเร็จการศึกษาระดับปริญญาตรีวิศวกรรมศาสตรบัณฑิต สาขาวิศวกรรมสิ่งแวดล้อม ภาควิชา วิศวกรรมสิ่งแวดล้อม คณะวิศวกรรมศาสตร์ มหาวิทยาลัยเชียงใหม่ ในปีการศึกษา 2538 และ เข้าศึกษาต่อในหลักสูตรวิศวกรรมศาสตรมหาบัณฑิตวิทยาลัย สาขาวิศวกรรมสิ่งแวดล้อม ภาควิชา วิศวกรรมสิ่งแวดล้อม คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ในปีการศึกษา 2540