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APPENDICES



## Appendix A

## Preparation of Predicted and Corrected Dye Solution

Stock dye solutions were used in the preparation of dye solution, Tables A-1, A-2, A-3, and A-4 show the quantity of each dye in ml. used to obtain the required concentration in percentage. In addition to dyes, all the dye bath solutions consisted of NaCl and Na<sub>2</sub>CO<sub>3</sub> in quantity as specified in

Table 3.1

Table A-1 The predicted concentration of dyes for two color mixtures

Dyes	%	ml.	%	ml.	%	ml.	%	ml.	%	ml.	Remarks
3R	0.714	28.56	1.446	57.84	1.784	71.36	2.134	85.36	3.005	120.2	Stock Dye Solution 1.25g/l
2R	2.950	118.0	2.358	94.32	1.968	78.72	1.601	64.04	0.802	32.08	
3R	0.678	27.12	1.671	66.84	2.048	81.92	2.53	101.2	3.187	127.48	
5B	2.743	109.72	2.369	94.76	1.99	79.6	1.677	67.08	0.637	25.48	
3R	0.849	33.96	1.725	69.	2.139	85.56	2.545	101.8	3.272	130.88	
4GD	2.686	107.44	2.283	91.32	1.991	79.64	1.619	64.76	0.559	22.36	
2R	0.831	33.24	1.593	63.72	1.877	75.08	2.217	88.68	2.889	115.56	
4GD	2.712	108.48	2.326	93.04	1.979	79.16	1.677	67.08	0.555	22.2	
4GD	0.593	23.72	1.603	64.12	1.985	79.4	2.287	91.48	2.682	107.28	
5B	2.677	107.08	2.038	81.52	1.748	69.92	1.504	60.16	0.895	35.8	
G	0.401	16.04	1.481	59.24	1.909	76.36	2.321	92.84	2.976	119.04	
5B	2.892	115.68	2.435	97.4	2.135	85.4	1.709	68.36	0.645	25.8	
G	0.468	18.72	1.767	70.68	2.218	88.72	2.807	112.28	3.251	130.04	
8G	3.609	144.36	2.78	111.2	2.289	91.56	1.727	69.08	0.471	18.84	

Table A-1 Cont'd

Dyes	%	ml.	%	ml.	%	ml.	%	ml.	%	ml.
G	0.352	14.08	1.331	53.24	1.660	66.4	2.232	89.28	2.819	112.76
3R	3.341	133.64	2.799	111.96	2.259	90.36	1.849	73.96	0.552	22.08
3R	0.273	10.92	1.198	47.92	1.729	69.16	2.383	95.32	3.355	134.2
8G	3.459	138.36	2.561	102.44	2.005	80.2	1.337	53.48	0.24	9.6
2R	0.763	30.52	1.237	49.48	1.523	60.92	1.858	74.32	2.809	112.36
5B	2.646	105.84	2.193	87.72	1.855	74.2	1.513	60.52	0.42	16.8

Table A-2 The predicted concentration of dyes for three color mixtures.

Dyes	%	ml.	%	ml.	%	ml.	%	ml.	%	ml.	Remarks
2R	0.679	33.95	1.124	56.2	1.521	76.05	1.894	94.7	2.181	109.05	Stock
3R	1.008	50.4	2.173	108.65	0.899	44.95	1.325	66.25	0.423	21.15	Dye
4GD	2.217	110.85	0.492	24.6	1.582	79.1	0.495	24.75	1.091	54.55	Solution
2R	0.501	25.05	0.950	47.5	1.556	77.8	1.708	85.4	2.384	119.2	1 g/l
5B	1.029	51.45	1.906	95.3	0.693	34.65	1.175	58.75	0.129	6.45	
4GD	2.258	112.9	0.549	27.45	1.713	85.65	0.555	27.75	1.166	58.3	
G	0.248	12.4	1.497	74.85	1.148	57.4	1.933	96.65	1.988	99.4	
4GD	1.153	57.65	1.863	93.15	1.107	55.35	1.448	72.4	0.651	32.55	
3R	2.451	122.55	0.724	36.2	1.602	80.1	0.647	32.35	1.084	54.2	
3R	0.617	30.85	0.897	44.85	1.586	79.3	1.868	93.4	2.732	136.6	
8G	1.036	51.8	2.551	127.55	1.110	55.5	1.524	76.2	0.312	15.6	
G	2.343	117.15	0.427	21.35	1.278	63.9	0.348	17.4	0.804	40.2	
G	0.233	11.65	1.506	75.3	1.332	66.6	1.774	88.7	2.017	100.85	
4GD	1.219	60.95	1.875	93.75	1.163	58.15	1.453	72.65	0.644	32.2	
5B	2.101	105.05	0.856	42.8	1.578	78.9	0.732	36.6	1.220	61.	

Table A-3 The corrected concentration of dyes for two color mixtures

	%	ml.	%	ml.	%	ml.	%	ml.	%	ml.	Remarks
3R	0.745	29.8	1.451	58.04	1.869	74.76	2.293	91.72	3.280	131.2	Stock
2R	3.435	137.4	2.641	105.64	2.107	84.28	1.670	66.8	0.646	25.84	Dye
3R	0.552	22.08	1.531	61.24	1.995	79.8	2.560	102.4	3.282	131.28	Solution
5B	3.005	120.2	2.448	97.92	1.979	79.16	1.560	62.4	0.488	19.52	1.25g/l
3R	0.625	25.	1.636	65.44	2.161	86.44	2.729	109.16	3.439	137.56	
4GD	3.036	121.44	2.482	99.28	2.079	83.16	1.707	68.28	0.530	21.2	
2R	0.781	31.24	1.763	70.52	2.116	84.64	2.595	103.8	3.387	135.48	
4GD	3.102	124.08	2.439	97.56	1.947	77.88	1.609	64.36	0.510	20.4	
4GD	0.461	18.44	1.474	58.96	1.961	78.44	2.477	99.08	3.060	122.4	
5B	2.945	117.8	2.198	87.92	1.824	72.96	1.473	58.92	0.645	25.8	
G	0.526	21.04	1.756	70.24	2.247	89.88	2.739	109.56	3.308	132.32	
5B	3.167	126.68	2.498	99.92	2.100	84.	1.571	62.84	0.443	17.72	
G	0.465	18.6	1.475	59.	2.235	89.4	2.763	110.52	3.567	142.68	
8G	3.639	145.56	2.608	104.32	2.158	86.32	1.620	64.8	0.555	22.2	
G	0.495	19.8	1.647	65.88	2.092	83.68	2.828	113.12	3.311	132.44	
3R	3.430	137.2	2.658	106.32	2.036	81.44	1.691	67.64	0.499	19.96	
3R	0.432	17.28	1.422	56.88	1.885	75.4	2.479	99.16	3.221	128.84	
8G	3.401	136.04	2.409	96.36	1.901	76.04	1.340	53.6	0.538	21.52	
2R	1.009	40.36	1.603	64.12	1.900	76.	2.283	91.32	2.961	118.44	
5B	2.921	116.84	2.302	92.08	1.972	78.88	1.626	65.04	0.831	33.24	

Table A-4 The corrected concentration of dyes for three color mixtures

	%	ml	%	ml	%	ml	%	ml	%	ml	Remarks
2R	0.626	31.3	1.107	55.35	1.705	85.25	2.062	103.1	2.628	131.4	Stock
3R	0.981	49.05	2.206	110.3	0.944	47.2	1.321	66.05	0.548	27.4	Dye
4GD	2.347	117.35	0.480	24.0	1.475	73.75	0.394	19.7	0.957	47.85	Solution
2R	0.598	29.9	1.094	54.7	1.842	92.1	1.880	94.	2.386	119.3	I.g/l
5B	1.062	53.1	2.273	113.65	0.896	44.8	1.501	75.05	0.660	33.	
4GD	2.381	119.05	0.372	18.6	1.711	85.55	0.401	20.05	0.983	49.15	
G	0.483	24.15	1.818	90.9	1.433	71.65	2.550	127.5	2.454	122.7	
4GD	0.979	48.95	2.081	104.05	0.945	47.25	1.485	74.25	0.499	24.95	
3R	2.474	123.7	0.608	30.4	1.432	71.6	0.584	29.2	0.950	47.5	
3R	0.278	13.9	0.947	47.35	1.072	53.6	1.575	78.75	2.154	107.7	
8G	1.157	57.85	2.405	120.25	1.391	69.55	1.626	81.3	0.797	39.85	
G	2.268	113.4	0.464	23.2	1.293	64.65	0.363	18.15	0.878	43.9	
G	0.508	25.4	1.589	79.45	1.703	85.15	2.103	105.15	2.666	133.3	
4GD	1.056	52.8	2.106	105.3	1.057	52.85	1.519	75.95	0.483	24.15	
5B	2.396	119.8	0.731	36.55	1.674	83.7	0.573	28.65	1.233	61.65	

## Appendix B

The K/S function against R in %

$\frac{(1-R)^2}{2R} = K/S$		(against R in %)							
%R	K/S	%R	K/S	%R	K/S	%R	K/S	%R	K/S
0.0		5.0	9.02	10.0	4.05	15.0	2.41	20.0	1.600
.1	449.	.1	8.83	.1	4.00	.1	2.39	.1	1.588
.2	249.	.2	8.64	.2	3.95	.2	2.37	.2	1.576
.3	166.	.3	8.46	.3	3.91	.3	2.34	.3	1.565
.4	124.	.4	8.29	.4	3.86	.4	2.32	.4	1.553
.5	99.0	.5	8.12	.5	3.81	.5	2.30	.5	1.542
.6	82.3	.6	7.96	.6	3.77	.6	2.28	.6	1.530
.7	70.4	.7	7.80	.7	3.73	.7	2.26	.7	1.519
.8	61.5	.8	7.65	.8	3.68	.8	2.24	.8	1.508
.9	54.6	.9	7.50	.9	3.64	.9	2.22	.9	1.497
1.0	49.0	6.0	7.36	11.0	3.60	16.0	2.21	21.0	1.486
.1	44.5	.1	7.23	.1	3.56	.1	2.19	.1	1.475
.2	40.7	.2	7.10	.2	3.52	.2	2.17	.2	1.465
.3	37.5	.3	6.97	.3	3.48	.3	2.15	.3	1.454
.4	34.7	.4	6.84	.4	3.44	.4	2.13	.4	1.443
.5	32.3	.5	6.73	.5	3.41	.5	2.11	.5	1.433
.6	30.3	.6	6.61	.6	3.37	.6	2.10	.6	1.423
.7	28.4	.7	6.50	.7	3.33	.7	2.08	.7	1.413
.8	26.8	.8	6.39	.8	3.30	.8	2.06	.8	1.403
.9	25.3	.9	6.28	.9	3.26	.9	2.04	.9	1.393
2.0	24.0	7.0	6.18	12.0	3.23	17.0	2.03	22.0	1.383
.1	22.8	.1	6.08	.1	3.19	.1	2.01	.1	1.373
.2	21.7	.2	5.98	.2	3.16	.2	1.993	.2	1.363
.3	20.8	.3	5.89	.3	3.13	.3	1.977	.3	1.354
.4	19.85	.4	5.79	.4	3.09	.4	1.961	.4	1.344
.5	19.01	.5	5.70	.5	3.06	.5	1.945	.5	1.335
.6	18.24	.6	5.62	.6	3.03	.6	1.929	.6	1.325
.7	17.53	.7	5.53	.7	3.00	.7	1.913	.7	1.316
.8	16.87	.8	5.45	.8	2.97	.8	1.898	.8	1.307
.9	16.26	.9	5.37	.9	2.94	.9	1.883	.9	1.298
3.0	15.68	8.0	5.29	13.0	2.91	18.0	1.868	23.0	1.289
.1	15.14	.1	5.21	.1	2.88	.1	1.853	.1	1.280
.2	14.64	.2	5.14	.2	2.85	.2	1.838	.2	1.271
.3	14.17	.3	5.07	.3	2.83	.3	1.824	.3	1.262
.4	13.72	.4	4.99	.4	2.80	.4	1.809	.4	1.254
.5	13.30	.5	4.93	.5	2.77	.5	1.795	.5	1.245
.6	12.91	.6	4.86	.6	2.74	.6	1.781	.6	1.237
.7	12.53	.7	4.79	.7	2.72	.7	1.767	.7	1.228
.8	12.18	.8	4.73	.8	2.69	.8	1.754	.8	1.220
.9	11.84	.9	4.66	.9	2.67	.9	1.740	.9	1.212
4.0	11.52	9.0	4.60	14.0	2.64	19.0	1.727	24.0	1.203
.1	11.22	.1	4.54	.1	2.62	.1	1.713	.1	1.195
.2	10.93	.2	4.48	.2	2.59	.2	1.700	.2	1.187
.3	10.65	.3	4.42	.3	2.57	.3	1.687	.3	1.179
.4	10.39	.4	4.37	.4	2.54	.4	1.674	.4	1.171
.5	10.13	.5	4.31	.5	2.52	.5	1.662	.5	1.163
.6	9.89	.6	4.26	.6	2.50	.6	1.649	.6	1.156
.7	9.66	.7	4.20	.7	2.48	.7	1.637	.7	1.148
.8	9.44	.8	4.15	.8	2.45	.8	1.624	.8	1.140
.9	9.23	.9	4.10	.9	2.43	.9	1.612	.9	1.133



## Appendix B Cont'd

%R	K/S	%R	K/S	%R	K/S	%R	K/S	%R	K/S
25-0	1-125	30-0	-817	35-0	-604	40-0	-450	45-0	-336
-1	1-118	-1	-812	-1	-600	-1	-447	-1	-334
-2	1-110	-2	-807	-2	-596	-2	-445	-2	-332
-3	1-103	-3	-802	-3	-593	-3	-442	-3	-330
-4	1-096	-4	-797	-4	-589	-4	-440	-4	-328
-5	1-088	-5	-792	-5	-586	-5	-437	-5	-326
-6	1-081	-6	-787	-6	-583	-6	-435	-6	-325
-7	1-074	-7	-782	-7	-579	-7	-432	-7	-323
-8	1-067	-8	-777	-8	-576	-8	-430	-8	-321
-9	1-060	-9	-773	-9	-572	-9	-427	-9	-319
26-0	1-053	31-0	-768	36-0	-569	41-0	-425	46-0	-317
-1	1-046	-1	-763	-1	-566	-1	-422	-1	-315
-2	1-039	-2	-759	-2	-562	-2	-420	-2	-313
-3	1-033	-3	-754	-3	-559	-3	-417	-3	-311
-4	1-026	-4	-749	-4	-556	-4	-415	-4	-310
-5	1-019	-5	-745	-5	-552	-5	-412	-5	-308
-6	1-013	-6	-740	-6	-549	-6	-410	-6	-306
-7	1-006	-7	-736	-7	-546	-7	-408	-7	-304
-8	1-000	-8	-731	-8	-543	-8	-405	-8	-302
-9	-993	-9	-727	-9	-540	-9	-403	-9	-301
27-0	-987	32-0	-723	37-0	-536	42-0	-401	47-0	-299
-1	-981	-1	-718	-1	-533	-1	-398	-1	-297
-2	-974	-2	-714	-2	-530	-2	-396	-2	-295
-3	-968	-3	-710	-3	-527	-3	-394	-3	-294
-4	-962	-4	-705	-4	-524	-4	-391	-4	-292
-5	-956	-5	-701	-5	-521	-5	-389	-5	-290
-6	-950	-6	-697	-6	-518	-6	-387	-6	-288
-7	-944	-7	-693	-7	-515	-7	-385	-7	-287
-8	-938	-8	-688	-8	-512	-8	-382	-8	-285
-9	-932	-9	-684	-9	-509	-9	-380	-9	-283
28-0	-926	33-0	-680	38-0	-506	43-0	-378	48-0	-282
-1	-920	-1	-676	-1	-503	-1	-376	-1	-280
-2	-914	-2	-672	-2	-500	-2	-373	-2	-278
-3	-908	-3	-668	-3	-497	-3	-371	-3	-277
-4	-903	-4	-664	-4	-494	-4	-369	-4	-275
-5	-897	-5	-660	-5	-491	-5	-367	-5	-273
-6	-891	-6	-656	-6	-488	-6	-365	-6	-272
-7	-886	-7	-652	-7	-486	-7	-363	-7	-270
-8	-880	-8	-648	-8	-483	-8	-361	-8	-269
-9	-875	-9	-644	-9	-480	-9	-358	-9	-267
29-0	-869	34-0	-641	39-0	-477	44-0	-356	49-0	-265
-1	-864	-1	-637	-1	-474	-1	-354	-1	-264
-2	-858	-2	-633	-2	-472	-2	-352	-2	-262
-3	-853	-3	-629	-3	-469	-3	-350	-3	-261
-4	-848	-4	-626	-4	-466	-4	-348	-4	-259
-5	-842	-5	-622	-5	-463	-5	-346	-5	-258
-6	-837	-6	-618	-6	-461	-6	-344	-6	-256
-7	-832	-7	-614	-7	-458	-7	-342	-7	-255
-8	-827	-8	-611	-8	-455	-8	-340	-8	-253
-9	-822	-9	-607	-9	-453	-9	-338	-9	-252

Appendix B Cont'd

%R	K/S	%R	K/S	%R	K/S	%R	K/S	%R	K/S
50-0	0-250	55-0	0-1841	60-0	0-1333	65-0	0-0942	70-0	0-0643
.1	.249	.1	.1829	.1	.1325	.1	.0936	.1	.0638
.2	.247	.2	.1818	.2	.1316	.2	.0929	.2	.0633
.3	.246	.3	.1807	.3	.1307	.3	.0922	.3	.0627
.4	.244	.4	.1795	.4	.1298	.4	.0915	.4	.0622
.5	.243	.5	.1784	.5	.1290	.5	.0909	.5	.0617
.6	.241	.6	.1773	.6	.1281	.6	.0902	.6	.0612
.7	.240	.7	.1762	.7	.1272	.7	.0895	.7	.0607
.8	.238	.8	.1751	.8	.1264	.8	.0889	.8	.0602
.9	.237	.9	.1740	.9	.1255	.9	.0882	.9	.0597
51-0	0-235	56-0	0-1729	61-0	0-1247	66-0	0-0876	71-0	0-0592
.1	.234	.1	.1718	.1	.1238	.1	.0869	.1	.0587
.2	.233	.2	.1707	.2	.1230	.2	.0863	.2	.0583
.3	.231	.3	.1696	.3	.1222	.3	.0857	.3	.0578
.4	.230	.4	.1685	.4	.1213	.4	.0850	.4	.0573
.5	.228	.5	.1675	.5	.1205	.5	.0844	.5	.0568
.6	.227	.6	.1664	.6	.1197	.6	.0838	.6	.0563
.7	.226	.7	.1653	.7	.1189	.7	.0831	.7	.0559
.8	.224	.8	.1643	.8	.1181	.8	.0825	.8	.0554
.9	.223	.9	.1632	.9	.1173	.9	.0819	.9	.0549
52-0	0-222	57-0	0-1622	62-0	0-1165	67-0	0-0813	72-0	0-0544
.1	.220	.1	.1612	.1	.1157	.1	.0807	.1	.0540
.2	.219	.2	.1601	.2	.1149	.2	.0801	.2	.0535
.3	.218	.3	.1591	.3	.1141	.3	.0794	.3	.0531
.4	.216	.4	.1581	.4	.1133	.4	.0788	.4	.0526
.5	.215	.5	.1571	.5	.1125	.5	.0782	.5	.0522
.6	.214	.6	.1561	.6	.1117	.6	.0776	.6	.0517
.7	.212	.7	.1551	.7	.1110	.7	.0771	.7	.0513
.8	.211	.8	.1541	.8	.1102	.8	.0765	.8	.0508
.9	.210	.9	.1531	.9	.1094	.9	.0759	.9	.0504
53-0	0-208	58-0	0-1521	63-0	0-1087	68-0	0-0753	73-0	0-0499
.1	.207	.1	.1511	.1	.1079	.1	.0747	.1	.0495
.2	.206	.2	.1501	.2	.1071	.2	.0741	.2	.0491
.3	.205	.3	.1491	.3	.1064	.3	.0736	.3	.0486
.4	.203	.4	.1482	.4	.1056	.4	.0730	.4	.0482
.5	.202	.5	.1472	.5	.1049	.5	.0724	.5	.0478
.6	.201	.6	.1462	.6	.1042	.6	.0719	.6	.0474
.7	.1996	.7	.1453	.7	.1034	.7	.0713	.7	.0469
.8	.1984	.8	.1443	.8	.1027	.8	.0707	.8	.0465
.9	.1971	.9	.1434	.9	.1020	.9	.0702	.9	.0461
54-0	0-1959	59-0	0-1425	64-0	0-1013	69-0	0-0696	74-0	0-0457
.1	.1947	.1	.1415	.1	.1005	.1	.0691	.1	.0453
.2	.1935	.2	.1406	.2	.0998	.2	.0685	.2	.0449
.3	.1923	.3	.1397	.3	.0991	.3	.0680	.3	.0445
.4	.1911	.4	.1388	.4	.0984	.4	.0675	.4	.0440
.5	.1899	.5	.1378	.5	.0977	.5	.0669	.5	.0436
.6	.1888	.6	.1369	.6	.0970	.6	.0664	.6	.0432
.7	.1876	.7	.1360	.7	.0963	.7	.0659	.7	.0428
.8	.1864	.8	.1351	.8	.0956	.8	.0654	.8	.0425
.9	.1853	.9	.1342	.9	.0949	.9	.0649	.9	.0421

Appendix B Cont'd

%R	K/S	%R	K/S	%R	K/S	%R	K/S	%R	K/S
75-0	0-0417	80-0	0-0250	85-0	0-0132	90-0	0-00556	95-0	0-00132
-1	-0413	-1	-0247	-1	-0130	-1	-00544	-1	-00126
-2	-0409	-2	-0244	-2	-0129	-2	-00532	-2	-00121
-3	-0405	-3	-0242	-3	-0127	-3	-00521	-3	-00116
-4	-0401	-4	-0239	-4	-0125	-4	-00510	-4	-00111
-5	-0398	-5	-0236	-5	-0123	-5	-00499	-5	-00106
-6	-0394	-6	-0234	-6	-0121	-6	-00488	-6	-00101
-7	-0390	-7	-0231	-7	-0119	-7	-00477	-7	-00097
-8	-0386	-8	-0228	-8	-0118	-8	-00466	-8	-00092
-9	-0383	-9	-0226	-9	-0116	-9	-00456	-9	-00088
76-0	0-0379	81-0	0-0223	86-0	0-0114	91-0	0-00445	96-0	0-00083
-1	-0375	-1	-0220	-1	-0112	-1	-00435	-1	-00079
-2	-0372	-2	-0218	-2	-0111	-2	-00425	-2	-00075
-3	-0368	-3	-0215	-3	-0109	-3	-00415	-3	-00071
-4	-0365	-4	-0213	-4	-0107	-4	-00405	-4	-00067
-5	-0361	-5	-0210	-5	-0105	-5	-00395	-5	-00064
-6	-0357	-6	-0208	-6	-0104	-6	-00385	-6	-00060
-7	-0354	-7	-0205	-7	-0102	-7	-00376	-7	-00056
-8	-0350	-8	-0203	-8	-0100	-8	-00366	-8	-00053
-9	-0347	-9	-0200	-9	-00987	-9	-00357	-9	-00050
77-0	0-0344	82-0	0-0198	87-0	0-00971	92-0	0-00348	97-0	0-00046
-1	-0340	-1	-0195	-1	-00955	-1	-00339	-1	-00043
-2	-0337	-2	-0193	-2	-00939	-2	-00330	-2	-00040
-3	-0333	-3	-0190	-3	-00924	-3	-00321	-3	-00038
-4	-0330	-4	-0188	-4	-00908	-4	-00313	-4	-00035
-5	-0327	-5	-0186	-5	-00893	-5	-00304	-5	-00032
-6	-0323	-6	-0183	-6	-00878	-6	-00296	-6	-00030
-7	-0320	-7	-0181	-7	-00863	-7	-00287	-7	-00027
-8	-0317	-8	-0179	-8	-00848	-8	-00279	-8	-00025
-9	-0314	-9	-0176	-9	-00833	-9	-00271	-9	-00023
78-0	0-0310	83-0	0-0174	88-0	0-00818	93-0	0-00263	98-0	0-00020
-1	-0307	-1	-0172	-1	-00804	-1	-00256	-1	-00018
-2	-0304	-2	-0170	-2	-00789	-2	-00248	-2	-00017
-3	-0301	-3	-0167	-3	-00775	-3	-00241	-3	-00015
-4	-0298	-4	-0165	-4	-00761	-4	-00233	-4	-00013
-5	-0294	-5	-0163	-5	-00747	-5	-00226	-5	-00011
-6	-0291	-6	-0161	-6	-00733	-6	-00219	-6	-00010
-7	-0288	-7	-0159	-7	-00720	-7	-00212	-7	-00009
-8	-0285	-8	-0157	-8	-00706	-8	-00205	-8	-00007
-9	-0282	-9	-0155	-9	-00693	-9	-00198	-9	-00006
79-0	0-0279	84-0	0-0152	89-0	0-00680	94-0	0-00192	99-0	0-00005
-1	-0276	-1	-0150	-1	-00667	-1	-00185	-1	-00004
-2	-0273	-2	-0148	-2	-00654	-2	-00179	-2	-00003
-3	-0270	-3	-0146	-3	-00641	-3	-00172	-3	-00002
-4	-0267	-4	-0144	-4	-00628	-4	-00166	-4	-00002
-5	-0264	-5	-0142	-5	-00616	-5	-00160	-5	-00001
-6	-0261	-6	-0140	-6	-00604	-6	-00154	-6	-00001
-7	-0259	-7	-0138	-7	-00591	-7	-00148	-7	-00000
-8	-0256	-8	-0136	-8	-00579	-8	-00143	-8	-00000
-9	-0253	-9	-0134	-9	-00567	-9	-00137	-9	-00000
								100-0	0-00000

## APPENDIX C

## METAMERISM

(9) is a phenomenon occurring when patterns match in one light and not in another indicating that their reflectance curves - the fingerprints of a colour are not identical.

There are 4 types of "metamerism"

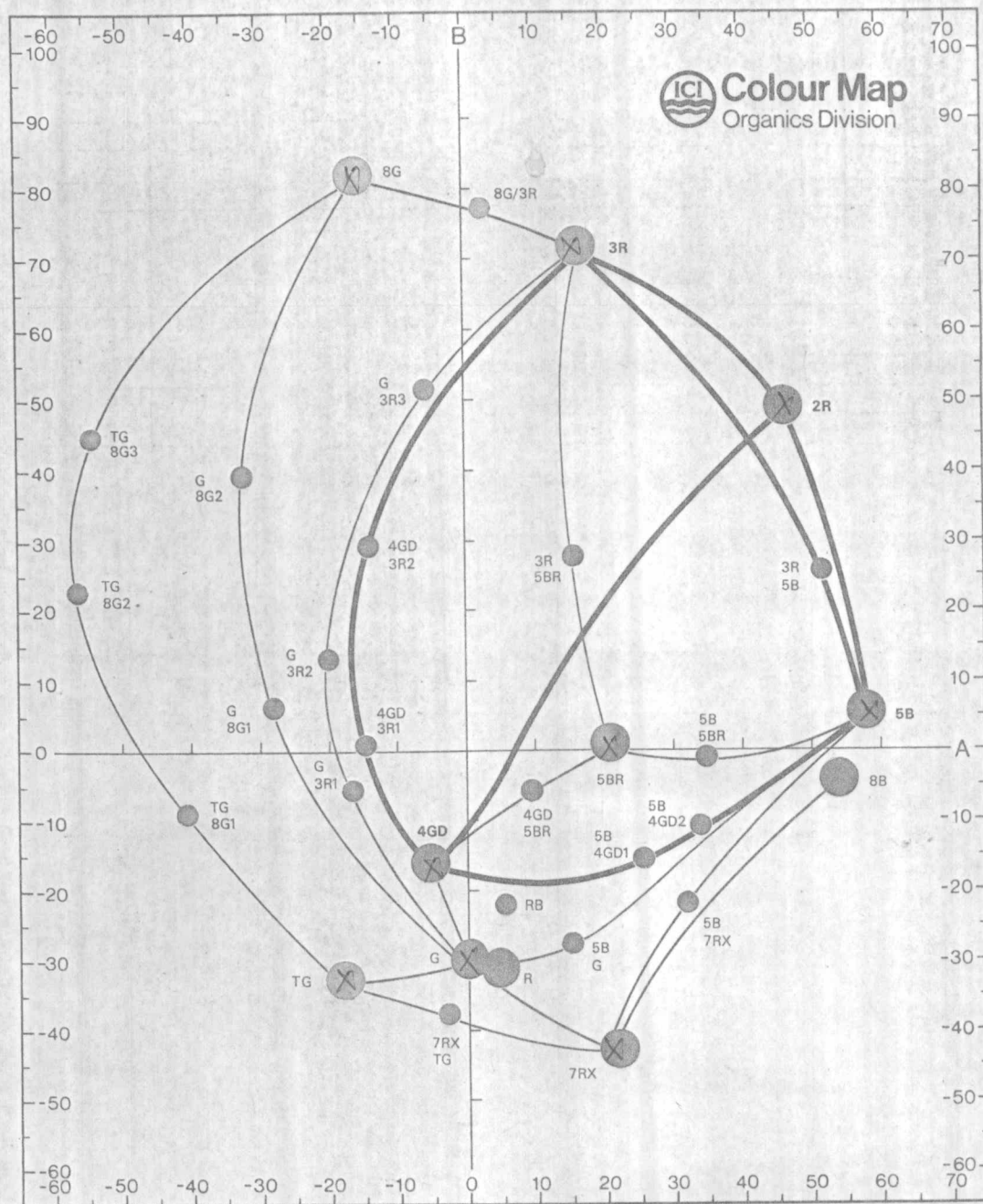
i) Illuminant metamerism ... where two patterns match in one particular light but not in order.

ii) Observer metamerism ... caused by differences in the made up of the eyes of persons with normal colour vision redder, greener, etc.

iii) Geometric metamerism ... when two materials match under one set of viewing conditions of angle or orientation and not another of, velvets, carpets, pile fabrics, etc.

iv) Instrumental metamerism ... There is always a slight difference between instruments even of the same make or marque.

Appendix D  
I.C.I. Colour Map of Precion MX dyes



## Autobiography



Sombat Asavapiyanond was born on October 7, 1954 in Bangkok, Thailand. He attended Triam Udom High School in Bangkok and graduated in 1971. He received his Bachelor Degree in Chemical Engineering from Chulalongkorn University, Thailand, in October, 1975. Following the graduation, he took one month training program of dyeing and printing at the Bayer Company in Hongkong, after that he worked at the Textile Industry Division. At the same time he continued his Master's study at the same university. In March of 1978, he worked at the B.C.C. Transfer Printing Factory and dropped his study because he went abroad to see the printing machine in Taiwan and continued on the second semester of 1979 Academic year. He was granted the degree in March of 1979. Now he works at The B.C.C. Transfer Printing Factory, Samutprakan, Thailand.