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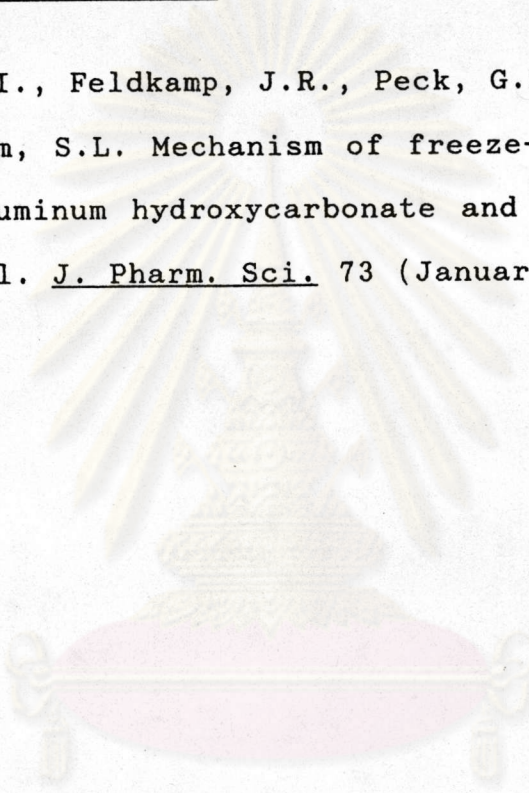
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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



APPENDIX

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Table 29

The Point of Zero Charge of Gel 1 during aging at ambient temperature

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.99	7.80	7.74	0.0	7.99	7.80	7.74	initial
0.2	8.03	7.83	7.76	1.0	7.57	7.42	7.40	
0.4	8.06	7.86	7.79	2.0	7.18	7.11	7.08	
0.6	8.10	7.90	7.82	3.0	6.86	6.78	6.76	
0.8	8.14	7.94	7.86	4.0	6.60	6.54	6.53	
1.0	8.19	7.98	7.90	4.2	6.54	6.52	6.51	
1.2	8.22	8.02	7.94	4.4	6.46	6.48	6.49	
1.4	8.26	8.06	7.98	4.6	6.43	6.45	6.48	
1.6	8.31	8.11	8.03	4.8	6.39	6.42	6.46	
1.8	8.36	8.16	8.08	5.0	6.32	6.40	6.43	
2.0	8.41	8.22	8.14					
Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	8.03	7.95	7.66	0.0	8.03	7.95	7.66	after storage for 3 months
1.0	8.20	8.02	7.70	3.0	6.82	6.80	6.72	
2.0	8.41	8.20	7.86	3.2	6.76	6.75	6.68	
3.0	8.61	8.38	8.01	3.4	6.72	6.69	6.64	
4.0	8.75	8.50	8.11	3.6	6.66	6.64	6.62	
				3.8	6.62	6.61	6.61	
				4.0	6.58	6.59	6.59	
				4.2	6.53	6.55	6.58	
				4.4	6.50	6.51	6.54	
				4.6	6.46	6.48	6.51	
				4.8	6.40	6.43	6.47	
				5.0	6.36	6.40	6.46	
Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.95	7.64	7.53	0.0	7.95	7.64	7.53	after storage for 6 months
1.0	8.17	7.84	7.71	3.0	6.97	6.89	6.85	
2.0	8.37	8.02	7.87	3.2	6.93	6.86	6.83	
3.0	8.58	8.21	8.04	3.4	6.87	6.83	6.80	
4.0	8.72	8.33	8.15	3.6	6.83	6.79	6.76	
				3.8	6.78	6.75	6.73	
				4.0	6.73	6.73	6.71	
				4.2	6.67	6.68	6.69	
				4.4	6.63	6.65	6.66	
				5.0	6.50	6.53	6.60	
				6.0	6.32	6.37	6.46	

Table 30

The Point of Zero Charge of Gel 2 during aging at ambient temperature

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength					
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2		
0.0	7.20	7.04	6.96	0.0	7.20	7.04	6.96	initial	
0.2	7.23	7.09	6.99	0.2	7.06	7.00	6.94		
0.4	7.28	7.16	7.05	0.4	7.00	6.95	6.91		
1.0	7.54	7.30	7.08	0.6	6.93	6.90	6.89		
2.0	7.80	7.75	7.50	0.8	6.87	6.88	6.88		
				1.0	6.83	6.85	6.86		
				1.2	6.77	6.80	6.82		
				1.4	6.72	6.75	6.78		
				1.6	6.65	6.69	6.74		
				1.8	6.60	6.65	6.71		
				2.0	6.54	6.60	6.68		
				3.0	6.28	6.37	6.49		
Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength					
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2		
0.0	7.18	7.09	7.07	0.0	7.18	7.09	7.07	after storage for 3 months	
0.8	7.35	7.16	7.13	0.4	7.09	7.03	7.02		
1.0	7.44	7.24	7.21	0.6	7.06	7.01	6.99		
1.2	7.50	7.28	7.26	0.8	7.01	6.98	6.95		
1.6	7.66	7.37	7.34	1.0	6.97	6.95	6.93		
1.8	7.73	7.42	7.39	1.2	6.93	6.91	6.90		
2.0	7.80	7.46	7.42	1.4	6.87	6.87	6.87		
				1.6	6.80	6.84	6.84		
				1.8	6.72	6.80	6.83		
				2.0	6.67	6.75	6.80		
				2.2	6.61	6.70	6.75		
Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength					
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2		
0.0	7.18	7.15	7.13	0.0	7.18	7.15	7.13	after storage for 6 months	
1.0	7.48	7.38	7.32	0.4	7.09	7.05	7.04		
2.0	7.85	7.73	7.64	0.6	7.00	6.97	6.96		
3.0	8.25	8.08	7.97	0.8	6.94	6.93	6.93		
4.0	8.67	8.45	8.32	1.0	6.89	6.90	6.91		
				1.2	6.84	6.87	6.89		
				1.4	6.80	6.86	6.88		
				2.0	6.70	6.78	6.81		
				3.0	6.51	6.63	6.69		
				4.0	6.23	6.37	6.43		

Table 31

The Point of Zero Charge of Gel 3 during aging at ambient temperature

Vol.KOH pH at various ionic strength				Vol.HCl pH at ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	6.75	6.83	6.84	0.0	6.75	6.83	6.84	initial
0.2	6.88	6.89	6.90	0.2	6.64	6.78	6.79	
0.4	6.95	6.95	6.94	0.4	6.52	6.74	6.75	
0.6	7.02	7.01	6.99	0.6	6.44	6.70	6.72	
0.8	7.09	7.06	7.02	0.8	6.36	6.66	6.68	
1.0	7.17	7.11	7.07	1.0	6.29	6.63	6.65	
1.2	7.24	7.14	7.10	1.2	6.22	6.58	6.62	
1.4	7.32	7.18	7.14	1.4	6.12	6.41	6.47	
2.0	7.39	7.24	7.19	2.0	5.82	6.30	6.35	

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	6.70	6.80	6.85	0.0	6.70	6.80	6.85	after storage for 3 months
0.2	6.77	6.85	6.89	0.2	6.64	6.74	6.79	
0.4	6.85	6.91	6.94	0.4	6.59	6.70	6.76	
0.6	6.97	7.01	7.03	0.6	6.53	6.64	6.71	
0.8	7.09	7.12	7.14	0.8	6.48	6.60	6.68	
1.0	7.18	7.20	7.21	1.0	6.40	6.54	6.63	
1.2	7.28	7.29	7.29					
1.4	7.33	7.32	7.31					
1.6	7.36	7.34	7.32					
1.8	7.41	7.37	7.34					
2.0	7.44	7.39	7.35					

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	6.69	6.92	7.03	0.0	6.69	6.92	7.03	after storage for 6 months
0.4	6.81	6.99	7.09	0.2	6.60	6.83	6.95	
1.0	7.01	7.14	7.22	0.4	6.52	6.76	6.89	
1.4	7.18	7.23	7.28	0.6	6.43	6.68	6.83	
1.8	7.30	7.32	7.34	0.8	6.33	6.60	6.76	
2.0	7.36	7.38	7.39	1.0	6.22	6.50	6.68	
2.2	7.44	7.43	7.43					
2.4	7.49	7.47	7.46					
2.6	7.56	7.52	7.50					
2.8	7.62	7.56	7.53					
3.0	7.68	7.62	7.58					

Table 32

The Point of Zero Charge of Gel 4 during aging at ambient temperature

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	6.71	6.86	6.90	0.0	6.71	6.86	6.90	initial
0.2	6.84	6.92	6.95	0.2	6.60	6.82	6.85	
0.4	6.94	6.97	6.99	0.4	6.47	6.77	6.82	
0.6	7.03	7.02	7.01	0.6	6.38	6.69	6.74	
0.8	7.11	7.05	7.03	0.8	6.30	6.63	6.68	
1.0	7.19	7.12	7.10	1.0	6.18	6.53	6.60	
1.2	7.27	7.16	7.13					
1.4	7.38	7.26	7.18					
1.6	7.44	7.30	7.24					
1.8	7.51	7.36	7.29					
2.0	7.60	7.43	7.34					

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	6.70	6.96	6.99	0.0	6.70	6.96	6.99	after storage for 3 months
0.2	6.78	7.03	7.06	0.2	6.64	6.92	6.96	
0.4	6.82	7.06	7.09	0.4	6.57	6.87	6.92	
0.6	6.99	7.13	7.16	0.6	6.48	6.80	6.86	
0.8	7.11	7.20	7.23	0.8	6.40	6.72	6.79	
1.0	7.22	7.29	7.31	1.0	6.28	6.61	6.69	
1.2	7.33	7.36	7.37					
1.4	7.40	7.40	7.39					
1.6	7.50	7.48	7.47					
1.8	7.63	7.60	7.58					
2.0	7.74	7.69	7.66					

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	6.64	6.87	6.99	0.0	6.64	6.87	6.99	after storage for 6 months
0.4	6.82	7.01	7.12	0.2	6.57	6.81	6.95	
0.6	6.99	7.12	7.19	0.4	6.49	6.74	6.89	
0.8	7.12	7.20	7.25	0.6	6.40	6.65	6.83	
1.0	7.25	7.30	7.32	0.8	6.32	6.57	6.76	
1.2	7.42	7.41	7.40	1.0	6.22	6.48	6.58	
1.4	7.52	7.47	7.45					
1.6	7.67	7.55	7.53					
1.8	7.76	7.64	7.58					
2.0	7.84	7.72	7.64					

Table 33

The Point of Zero Charge of Gel 5 during aging at ambient temperature

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	8.08	7.76	7.70	0.0	8.08	7.76	7.70	initial
1.0	8.21	8.00	7.76	3.0	6.85	6.79	6.76	
2.0	8.43	8.21	7.93	4.0	6.55	6.53	6.50	
3.0	8.65	8.42	8.17	4.2	6.48	6.44	6.40	
4.0	8.81	8.55	8.24	4.4	6.41	6.37	6.34	
5.0	8.95	8.65	8.32	4.6	6.35	6.32	6.31	
6.0	9.07	8.76	8.41	4.8	6.30	6.30	6.30	
				5.0	6.25	6.27	6.28	
				5.2	6.19	6.22	6.25	
				5.4	6.13	6.18	6.22	
				6.0	6.05	6.13	6.19	

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.84	7.66	7.57	0.0	7.84	7.66	7.57	after storage for 3 months
1.0	8.25	8.05	7.95	2.0	7.00	7.89	6.85	
2.0	8.66	8.45	8.34	2.2	6.94	6.84	6.81	
3.0	8.80	8.57	8.43	2.4	6.86	6.80	6.77	
4.0	8.87	8.63	8.47	2.6	6.81	6.76	6.73	
				2.8	6.74	6.70	6.68	
				3.0	6.68	6.65	6.64	
				3.2	6.62	6.60	6.59	
				3.4	6.56	6.56	6.55	
				3.6	6.52	6.53	6.54	
				3.8	6.46	6.48	6.49	
				4.0	6.41	6.45	6.47	

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.72	7.65	7.63	0.0	7.72	7.65	7.63	after storage for 6 months
1.0	8.25	8.21	8.12	1.0	7.34	7.27	7.25	
2.0	8.70	8.66	8.57	1.6	7.10	7.04	7.03	
3.0	8.78	8.73	8.63	1.8	7.05	7.01	7.00	
4.0	8.85	8.77	8.66	2.0	7.01	6.99	6.98	
5.0	8.93	8.83	8.70	2.2	6.95	6.96	6.96	
				2.4	6.84	6.88	6.90	
				2.6	6.79	6.84	6.87	
				2.8	6.76	6.81	6.84	
				3.0	6.74	6.79	6.82	
				4.0	6.60	6.68	6.74	

Table 34

The Point of Zero Charge of Gel 6 during aging at ambient temperature

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.19	7.21	7.24	0.0	7.19	7.21	7.24	initial
0.2	7.28	7.27	7.26	0.4	7.00	7.06	7.08	
0.4	7.35	7.33	7.31	0.8	6.79	6.90	6.96	
0.6	7.45	7.43	7.42	1.2	6.68	6.80	6.88	
0.8	7.53	7.50	7.47	2.0	6.26	6.47	6.56	
1.0	7.60	7.55	7.52	4.0	5.80	6.03	6.17	
2.0	7.93	7.82	7.77	6.0	5.63	5.87	6.00	
3.0	8.25	8.14	8.00					
4.0	8.48	8.33	8.19					

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.21	7.27	7.29	0.0	7.21	7.27	7.29	after storage for 3 months
0.4	7.35	7.41	7.43	0.4	7.05	7.13	7.17	
0.6	7.40	7.47	7.49	1.0	6.95	7.05	7.12	
1.6	7.65	7.68	7.70	2.0	6.87	6.97	7.05	
1.8	7.71	7.71	7.72	3.0	6.78	6.90	6.99	
2.0	7.77	7.75	7.74					
2.2	7.84	7.80	7.78					
2.6	8.00	7.95	7.91					
3.6	8.41	8.34	8.18					
4.6	8.62	8.52	8.35					
5.6	8.81	8.69	8.49					

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.01	7.13	7.21	0.0	7.01	7.13	7.21	after storage for 6 months
1.0	7.46	7.49	7.52	0.2	6.97	7.09	7.18	
1.2	7.54	7.58	7.60	0.4	6.90	7.04	7.14	
1.4	7.64	7.65	7.66	0.8	6.79	6.96	7.07	
1.6	7.71	7.71	7.72	1.0	6.70	6.90	7.02	
1.8	7.80	7.78	7.77					
2.0	7.87	7.84	7.80					
2.2	7.94	7.89	7.84					
2.4	8.00	7.94	7.88					
2.6	8.07	7.98	7.91					
2.8	8.15	8.03	7.94					
3.0	8.19	8.07	7.97					

Table 35

The Point of Zero Charge of Gel 7 during aging at ambient temperature

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.18	7.30	7.37	0.0	7.18	7.30	7.37	initial
1.0	7.60	7.63	7.66	0.4	7.12	7.28	7.35	
1.2	7.65	7.67	7.69	0.8	6.94	7.16	7.24	
1.4	7.70	7.71	7.73	1.0	6.88	7.10	7.19	
1.6	7.76	7.77	7.77	1.4	6.73	6.98	7.10	
1.8	7.80	7.80	7.79	2.0	6.57	6.86	7.01	
2.0	7.85	7.84	7.83					
2.2	7.89	7.88	7.86					
2.4	7.96	7.94	7.91					
2.6	8.01	7.97	7.93					
2.8	8.05	8.01	7.96					
3.0	8.14	8.09	8.03					

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.19	7.36	7.39	0.0	7.19	7.36	7.39	after storage for 3 months.
1.0	7.48	7.57	7.60	0.2	7.16	7.34	7.37	
2.0	7.72	7.74	7.76	0.4	7.14	7.31	7.35	
2.2	7.75	7.78	7.79	0.6	7.11	7.29	7.33	
2.4	7.81	7.81	7.81	0.8	7.08	7.26	7.31	
2.6	7.85	7.84	7.83	1.0	7.04	7.24	7.29	
2.8	7.89	7.88	7.87	2.0	6.32	6.54	6.62	
3.0	7.93	7.91	7.90					
4.0	8.14	8.08	8.06					
5.0	8.38	8.25	8.22					

Vol.KOH pH at various ionic strength				Vol.HCl pH at various ionic strength				
(ml)	0.0	0.1	0.2	(ml)	0.0	0.1	0.2	
0.0	7.18	7.34	7.41	0.0	7.18	7.34	7.41	after storage for 6 months
1.0	7.57	7.65	7.71	1.0	7.10	7.28	7.38	
1.2	7.66	7.72	7.78	2.0	7.00	7.20	7.32	
1.4	7.80	7.82	7.86	3.0	6.88	7.10	7.23	
1.6	7.87	7.89	7.92	4.0	6.76	7.00	7.15	
1.8	7.92	7.93	7.96	5.0	6.58	6.87	7.05	
2.0	8.00	8.00	7.99					
2.2	8.05	8.04	8.03					
2.4	8.12	8.09	8.07					
3.0	8.31	8.26	8.20					
4.0	8.64	8.54	8.47					
5.0	8.92	8.79	8.71					



VITAE

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