

"Hydrolysis as a Function of pH"

5. A N N E X

1. BUFFER MIXTURES (1)

A. CLARK AND LUBS

BUFFER MIXTURES OF CLARK AND LUBS* 0.2 N HCl and 0.2 N KCl at 20°

Composition	PH
47.5 ml. HCl + 25 ml. KCl dil. to 100 ml	1.0
32.25 ml. HCl + 25 ml. KCl dil. to 100 ml	1.2
20.75 ml. HCl + 25 ml. KCl dil. to 100 ml	1.4
13.15 ml. HCl + 25 ml. KCl dil. to 100 ml	1.6
8.3 ml. HCl + 25 ml. KCl dil. to 100 ml	1.8
5.3 ml. HCl + 25 ml. KCl dil. to 100 ml	2.0
3.35 ml. HCl + 25 ml. KCl dil. to 100 ml	2.2

0.1 M potassium biphthalate + 0.1 N HCl at 20°

46.70 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	2.2
39.60 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	2.4
32.95 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	2.6
26.42 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	2.8
20.32 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	3.0
14.70 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	3.2
9.90 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	3.4
5.97 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	3.6
2.63 ml. 0.1 N HCl + 50 ml. biphthalate to 100 ml	3.8

0.1 M potassium biphthalate + 0.1 N NaOH at 20°

0.40 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	4.0
3.70 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	4.2
7.50 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	4.4
12.15 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	4.6
17.70 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	4.8

* The pH values reported in these tables have been calculated from the potential measurements using Sørensen's standard equations (1909). The corresponding pH values are 0.04 unit higher than the tabulated values.

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Composition	pH
0.1 M potassium biphthalate + 0.1 NaOH at 20°	
23.85 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	5.0
29.95 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	5.2
35.45 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	5.4
39.85 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	5.6
43.00 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	5.8
45.45 ml. 0.1 N NaOH + 50 ml. biphthalate to 100 ml	6.0
0.1 M monopotassium phosphate + 0.1 N NaOH at 20°	
5.70 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	6.0
8.60 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	6.2
12.60 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	6.4
17.80 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	6.6
23.45 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	6.8
29.63 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	7.0
35.00 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	7.2
39.50 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	7.4
42.80 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	7.6
45.20 ml. 0.1 N NaOH + 50 ml. phosphate to 100 ml	7.8
46.80 ml. 0.1 N NaOH + 50 ml phosphate to 100 ml	8.0
0.1 M H ₂ B ₃ O ₆ in 0.1 M KCl + 0.1 N NaOH at 20°	
2.61 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	7.8
3.97 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	8.0
5.90 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	8.2
8.50 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	8.4
12.00 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	8.6
16.30 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	8.8
21.30 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	9.0
26.70 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	9.2
32.00 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	9.4
36.85 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	9.6
40.80 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	9.8
43.90 ml. 0.1 N NaOH + 50 ml. boric acid to 100 ml	10.0

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B. KOLTHOFF AND VLEESCHHOUWER

CITRATE BUFFERS OF KOLTHOFF AND VLEESCHHOUWER

0.1 M monopotassium citrate and 0.1 N HCl at 18°

(Add tiny crystal of thymol or a few milligrams of mercury to prevent growth of molds)

Composition	pH
49.7 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	2.2
43.4 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	2.4
36.8 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	2.6
30.2 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	2.8
23.6 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	3.0
17.2 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	3.2
10.7 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	3.4
4.2 ml. 0.1 N HCl + 50 ml. citrate to 100 ml	3.6

0.1 M monopotassium citrate and 0.1 N NaOH at 18°

(Add tiny crystal of thymol or a few milligrams of mercuric iodide to prevent growth of molds)

2.0 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	3.8
9.0 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	4.0
16.3 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	4.2
23.7 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	4.4
31.5 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	4.6
39.2 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	4.8
46.7 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	5.0
54.2 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	5.2
61.0 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	5.4
68.0 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	5.6
74.4 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	5.8
81.2 ml. 0.1 N NaOH + 50 ml. citrate to 100 ml	6.0

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C. SÖRENSEN

BORATE MIXTURES OF SÖRENSEN

0.05 M borax + 0.1 N HCl

Composition		Sörensen 18°	Walbum, pH at		
ml. Borax	ml. HCl		10°	40°	70°
5.25	4.75	7.62	7.64	7.55	7.47
5.50	4.50	7.94	7.98	7.86	7.76
5.75	4.25	8.14	8.17	8.06	7.95
6.00	4.00	8.29	8.32	8.19	8.08
6.50	3.50	8.51	8.54	8.40	8.28
7.00	3.00	8.08	8.72	8.56	8.40
7.50	2.50	8.80	8.84	8.67	8.50
8.00	2.00	8.91	8.96	8.77	8.59
8.50	1.50	9.01	9.06	8.86	8.67
9.00	1.00	9.09	9.14	8.94	8.74
9.50	0.50	9.17	9.22	9.01	8.80
10.0	0.00	9.24	9.30	9.08	8.86

0.05 M borax + 0.1 N NaOH

10.0	0.0	9.24	9.30	9.08	8.86
9.0	1.0	9.36	9.42	9.18	8.94
8.0	2.0	9.50	9.57	9.30	9.02
7.0	3.0	9.68	9.76	9.44	9.12
6.0	4.0	9.97	10.06	9.67	9.28