

Buffer Chart

Useful pH Ranges of Selected Biological Buffers (25° C, 0.1 M)

	pH	6	7	8	9	10	11	Useful pH Range	pKa (at 20°)	pKa (at 25°)	pKa (at 37°)
MES		6.0-6.5						5.5-6.7	6.16	6.10	5.97
BIS-TRIS		6.0-7.0						5.8-7.2	-	6.50	6.36
ADA		6.0-7.0						6.0-7.2	6.65	6.59	6.46
ACES		6.0-7.5						6.1-7.5	6.88	6.78	6.54
PIPES		6.0-7.5						6.1-7.5	6.80	6.76	6.66
MOPSO		6.0-7.5						6.2-7.6	-	6.90	6.75
BIS-TRIS PROPANE		6.0-9.0						6.3-9.5	-	6.8,9.0	-
BES		6.0-8.0						6.4-7.8	7.17	7.09	6.90
MOPS		6.0-8.0						6.5-7.9	7.13	7.20	7.70*
TES		6.0-8.5						6.8-8.2	7.50	7.40	7.16
HEPES		6.0-8.5						6.8-8.2	7.55	7.48	7.31
DIPSO		6.0-8.5						7.0-8.2	-	7.60	7.35
MOBS		6.0-8.5						6.9-8.3	-	7.60	-
TAPSO		6.0-8.5						7.0-8.2	-	7.60	7.39
TRIZMA		6.0-9.0						7.0-9.0	8.20	8.06	7.72
HEPPSO		6.0-9.0						7.1-8.5	-	7.80	6.66
POPSO		6.0-9.0						7.2-8.5	-	7.80	7.63
TEA		6.0-9.0						7.3-8.3	-	7.80	-
EPPS		6.0-9.0						7.3-8.7	-	8.00	-
TRICINE		6.0-9.0						7.4-8.8	8.16	8.05	7.80
GLYCYLGLYCINE		6.0-9.0						7.5-8.9	-	8.20	-
BICINE		6.0-9.0						7.6-9.0	8.35	8.26	8.04
HEPBS		6.0-9.0						7.6-9.0	-	8.30	-
TAPS		6.0-9.0						7.7-9.1	8.31	8.40	8.90*
AMPD		6.0-9.0						7.8-9.7	-	8.80	-
TABS		6.0-9.0						8.2-9.6	-	8.90	-
AMPSO		6.0-9.0						8.3-9.7	-	9.00	9.10
CHES		6.0-9.0						8.6-10.0	-	9.30*	9.80*
CAPSO		6.0-9.0						8.9-10.3	-	9.60	9.43
AMP		6.0-9.0						9.0-10.5	-	9.70	-
CAPS		6.0-9.0						9.7-11.1	10.24	10.40	10.78
CABS		6.0-9.0						10.0-11.4	-	10.70	-

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*Determined by Sigma



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Trizma Buffer Table

Trizma Buffer Table - pH versus Temperature (Tris; Tris(hydroxymethyl)aminomethane)

pH at Temperature			g/L for 0.05 M Solution	
5 °C	25 °C	37 °C	Trizma® HCl	Trizma® Base
7.76	7.20	6.91	7.02	0.67
7.89	7.30	7.02	6.85	0.80
7.97	7.40	7.12	6.61	0.97
8.07	7.50	7.22	6.35	1.18
8.18	7.60	7.30	6.06	1.39
8.26	7.70	7.40	5.72	1.66
8.37	7.80	7.52	5.32	1.97
8.48	7.90	7.62	4.88	2.30
8.58	8.00	7.71	4.44	2.65
8.68	8.10	7.80	4.02	2.97
8.78	8.20	7.91	3.54	3.34
8.88	8.30	8.01	3.07	3.70
8.98	8.40	8.10	2.64	4.03
9.09	8.50	8.22	2.21	4.36
9.18	8.60	8.31	1.83	4.65
9.28	8.70	8.42	1.50	4.90
9.36	8.80	8.51	1.23	5.13
9.47	8.90	8.62	0.96	5.32
9.56	9.00	8.70	0.76	5.47

Tris has a pKa of 8.1 at 25 °C. Trizma Base and Trizma HCl can be blended to produce a buffer at any pH between 7 and 9.

The table specifies the amounts of Trizma HCl and Trizma Base required to prepare 0.05 M buffer solutions at various pH values and temperatures. Dissolve the indicated amounts of Trizma HCl and Trizma Base in water, to a final volume of 1 liter.

Trizma HCl and Trizma Base are somewhat hygroscopic at high humidity. For precise work, desiccation before weighing is recommended. Trizma solutions can be autoclaved.

Request Sigma Technical Bulletin No. 106B for more information on temperature and concentration effects, and on the use of pH electrodes with Trizma buffers.



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
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