



Common Biological Buffers

Many buffers change pH with temperature. This is an important consideration when using thermostable enzymes at elevated temperatures. Use the temperature coefficient given in the table to predict what the buffer will be at any given temperature.

	pH 6	7	8	9	10	11	Useful pH range	pKa (at 25°)	Temperature Coefficient
ACETATE							3.6-5.6	4.76	-0.0002
MES							5.5-6.7	6.10	-0.011
CITRATE							5.5-7.2	6.40	0.0
BIS-TRIS							5.8-7.2	6.50	0.0
MOPS							6.5-7.9	7.20	0.015
PHOSPHATE							5.8-8.0	7.20	-0.0028
CARBONATE							6.0-8.0	6.35	-0.0055
HEPES							6.8-8.2	7.48	-0.014
TRICINE							7.4-8.8	8.05	-0.021
TRIS							7.0-9.0	8.06	-0.028
BICINE							7.6-9.0	8.26	-0.018
TAPS							7.7-9.1	8.40	0.018
TAURINE							8.4-9.6	9.06	-0.022
BORATE							8.5-10.2	9.23	-0.0082
CAPS							9.7-11.1	10.40	-0.009

Example: What is the pH of Tris pH 9.5 at 72° C?

All Teknova buffers are adjusted at 25° C. Unless specified otherwise.

*From the chart the temperature coefficient is -0.03.
72° C - 25° C = 47° C,*

*multiplying by the coefficient we get 47 * -0.03 = -1.41
finally 9.5 + (-1.41) = 8.09*