

Biological Buffer Selection Guide

[GoldBio Buffers](#)



Buffer	Catalog #	pH Range	pKa (25°C)	Applications	Protocol Avail.	Comments
ACES	A-010	6.1-6.78	6.78	Cell culture media, agarose and polyacrylamide electrophoresis, isoelectric focusing of proteins, x-ray crystallography, and yeast and bacterial cell studies.	Y	Binds Cu ²⁺ and Mg ²⁺ . Significant absorption of UV light at 230 nm. Inhibits GABA receptor binding.
ADA	A-780	6.0-7.2	6.59	Protein crystallization, electrophoresis, scanning calorimetry and soil metal decontamination.	Y	Strong binding to Mn ²⁺ , Co ²⁺ , Ni ²⁺ , Zn ²⁺ , Cd ²⁺ , Pb ²⁺ and Cu ²⁺ . Absorbs UV light between 0.1 and 260 nm. Not suitable for BCA assay.
BES	B-780	6.4-7.8	7.09	Transfection, cell culture and protein quantification. Chromatography (gel filtration and cation). Bacterial endotoxin studies.	Y	Binds Cu ²⁺ and Co ²⁺ weakly. Suitable for BCA assay. Binds DNA and interferes with restriction enzymes.
Bicine	B-785	7.6-9.0	8.26	Protein crystallization, enzymatic reactions, a multiphasic buffer for SDS-PAGE. Cation exchange chromatography and NMR spectroscopy.	Y	Strong binding to Mg ²⁺ , Ca ²⁺ , Co ²⁺ , Fe ³⁺ and Cu ²⁺ . Weak binding to Mn ²⁺ .
Bis-Tris	B-020	5.8-7.2	6.46	Electrophoresis (sample, gel and running buffer), chromatography, protein purification, NMR spectroscopy and x-ray crystallography.	Y	Binds Cu ²⁺ and Pb ²⁺ . Substitute for cacodylate. Interacts with human liver FAB and affects protein dynamics. Not suitable for BCA assay.
Boric Acid	B-030	8.2-10.1	9.23	Capillary and gel electrophoresis. Plant micronutrient.		Binds carbohydrates and pyridine nucleotides, such as NAD ⁺ .
CAPS	C-040	9.7-11.1	10.4	SDS-PAGE, protein sequencing, crystallization, and quantification, enzymatic assays and cation exchange chromatography.	Y	Weak binding to most metals. Suitable for BCA assay.

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CAPS	C-040	9.7-11.1	10.40	SDS-PAGE, protein sequencing and quantification and enzymatic assays. Cation exchange chromatography and protein crystallization.	Y	Weak binding to most metals. Suitable for BCA assay.
CHES	C-870	8.6-10.0	9.50	Electrophoresis and enzymatic assays.	Y	Noncomplexing buffer. High affinity for iodoacetate binding site of liver alcohol dehydrogenase.
HEPES Free Acid	H-400	6.8-8.2	7.48	Cell culture, electroporation, qPCR, restriction enzymes, atomic force microscopy and electrophoresis. Protein quantification. Cation exchange chromatography.	Y	Noncomplexing buffer. May form radicals and not suitable for redox reactions. Binds DNA and affects restriction enzyme function.
HEPES Sodium Salt	H-401					
HEPPSO	H-480	7.1-8.5	7.84	Protein quantification. Toxicity studies. Isoelectric focusing and enzymatic studies.	Y	May form radicals and not suitable for redox reactions. Suitable for BCA assay.
MES Free Acid	M-095	5.5-6.7	6.10	Cell and plant culture media, protein electrophoresis, chromatography, electrochromatography. Toxicology studies in yeast (metal toxicity and removal). Fluorescence microscopy.	Y	Noncomplexing buffer. Substitute for cacodylate, citrate and malate buffers. Inhibits connexin channels. Binds human liver FAB protein.
MES Free Acid Monohydrate, Ultra Pure	M-090					
MES Sodium Salt	M-091					
MOPS Free Acid	M-790	6.5-7.9	7.14	Cell culture media, nucleic acid and protein electrophoresis, and protein purification and quantification. Spectroscopic and potentiometric studies. Toxicology studies in yeast (metal toxicity).	Y	Noncomplexing buffer. Filter sterilization required. Suitable for BCA assay.
MOPS Sodium Salt	M-791					

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MOPSO Free Acid MOPSO Sodium Salt	M-795 M-799	6.2-7.6	6.87	Cell culture media, protein electrophoresis and quantification. Fluorescence spectroscopy, spectrophotometry and isothermal titration calorimetry. Electrochromatography.	Y	Binds Fe ³⁺ .
PIPES Free Acid PIPES Sodium Salt	P-281 P-280	6.1-7.5	6.76	Cell culture, protein crystallization, electrophoresis, isoelectric focusing. Chromatography and protein quantification. Substitute for cacodylate.	Y	Noncomplexing buffer. May form radicals and not suitable for redox reactions. Suitable for BCA assay.
TES	T-785	6.8-8.2	7.40	DNA precipitation and extraction. Gel filtration and chromatography. Enzyme assays. Protein quantification.	Y	Binds strongly to Cr ³⁺ and Fe ³⁺ , and binds weakly to Co ²⁺ , Ni ²⁺ , Cu ²⁺ and Zn ²⁺ . Suitable for BCA assay.
Tricine	T-870	7.4-8.8	8.05	SDS-PAGE, capillary zone electrophoresis, HPLC and ion exchange chromatography, firefly luciferase assays. Lowry protein assay upon addition of Cu ²⁺ .	Y	Binds Cu ²⁺ strongly, Ca ²⁺ and Mn ²⁺ moderately and weakly to Mg ²⁺ . Substitute for barbital. Photooxidized by flavins and flavoproteins.
Tris (Tris Base) Tris-HCl	T-400 T-095	7.0-9.0	8.06	Electrophoresis, SDS-PAGE Laemmli buffer and other running/loading buffers with glycine, and SDS. Anion exchange chromatography.	Y	Reacts with DEPC, aldehydes, common metals, various enzymes and DNA. Not suitable for BCA assay. Not suitable for most cell culture work.
TAPS	T-780	7.7-9.1	8.40	DNA analysis, protein purification (ion exchange chromatography, planar chromatography), enzymatic assay (aminopeptidase activity), cell culture media (dinoflagellates).	Y	Inhibits connexin channels. Binds strongly to Cr ³⁺ , Fe ³⁺ and Cu ²⁺ .