

# Hampton Research Buffer Formulation

## Crystal Growth 101

### Hampton Research Buffer Formulation

- All buffers are formulated as 1.0 M stock solutions except CAPS and CAPSO which are formulated as 0.5 M stock solutions
- pH is measured at 25.0°C
- Formulated in Type 1+ ultrapure water: 18.2 megaohm-cm resistivity at 25°C, < 5 ppb Total Organic Carbon, bacteria free (<1 Bacteria (CFU/ml)), pyrogen free (<0.03 Endotoxin (EU/ml)), RNase-free (< 0.01 ng/mL) and DNase-free (< 4 pg/μL)
- Buffers are sterile filtered using 0.22 micron filters under sterile conditions
- The pH is adjusted using either Hydrochloric acid (HCl) or Sodium hydroxide (NaOH). See table 1 below.

Table 1

Buffer	pH Adjusted Using	Useful pH Range	pKa at 25°C
ADA	NaOH	5.6 - 7.5	6.6
AMPD	HCl	7.8 - 9.7	8.8
BICINE	NaOH	7.4 - 9.3	8.3
BIS-TRIS	HCl	5.5 - 7.5	6.5
BIS-TRIS propane	HCl	6.3 - 9.5	6.8 9.0
CAPS	NaOH	9.7 - 11.1	10.4
CAPSO	NaOH	8.9 - 10.3	9.6
CHES	NaOH	8.6 - 10.0	9.3
Citric acid	NaOH	2.2 - 6.5	3.1 4.8 6.4
Glycine	NaOH	8.6 - 10.6	2.3 9.6
HEPES	NaOH	6.8 - 8.2	7.5
HEPES sodium	HCl	6.8 - 8.2	7.5
Imidazole	HCl	6.2 - 7.8	7.0
DL-Malic acid	NaOH	3.7 - 6.0	3.4 5.1
MES monohydrate	NaOH	5.2 - 7.1	6.1
MOPS	NaOH	6.5 - 7.9	7.2
Sodium acetate trihydrate	HCl	3.6 - 5.6	4.8
Sodium cacodylate trihydrate	HCl	5.0 - 7.4	6.3
Sodium citrate tribasic dihydrate	HCl	2.2 - 6.5	3.1 4.8 6.4
Succinic acid	NaOH	3.2 - 6.5	4.2 5.6
Tricine	NaOH	7.4 - 8.8	8.1
Tris	HCl	7.0 - 9.0	8.1
TRIS hydrochloride	NaOH	7.0 - 9.0	8.1

Hampton Research  
34 Journey  
Aliso Viejo, CA 92656-3317 U.S.A.  
Tel: (949) 425-1321 • Fax: (949) 425-1611  
Technical Support e-mail: tech@hrmail.com  
Website: www.hamptonresearch.com