

StockOptions™ pH

Buffer Kit (pH 2.2 - 11.0)

HAMPTON
RESEARCH

Solutions for Crystal Growth

User Guide

HR2-241 (pg 1)

StockOptions™ pH Buffer Kit is a preformulated, sterile filtered set of titrated buffer stocks. The StockOptions buffer stock reagents are supplied as 1.0 M and 0.5 M stock solutions in 10 milliliter volumes. Each StockOptions pH Kit buffer reagent is carefully titrated using hydrochloric acid or sodium hydroxide. StockOptions pH Kit is comprised of 45 unique reagents covering the pH range of 2.2 to 11 in 0.2 pH unit increments.

Suggested Use

StockOptions pH Kit is designed to help researchers improve the speed, accuracy, precision, and quality of the formulation of crystallization screen solutions and crystallization optimization solutions. Researchers can use the individual StockOptions reagents to conveniently formulate custom screen solutions or standard screen solutions from Hampton Research kits such as Crystal Screen™, Crystal Screen Cryo™, Crystal Screen Lite™, Natrix™, Nucleic Acid Mini Screen™, and Crystal Screen 2™. StockOptions pH Kit reagents can also be used to create solutions for the refinement and optimization of preliminary crystallization conditions. Finally, StockOptions pH Kit reagents can be used to create accurate, precise, reproducible, high quality solutions for the production of single crystals. Utilizing the reagents in the StockOptions pH Kit buffer kit it is possible to formulate and screen 45 unique pH levels.

During crystallization experiments the buffer systems utilized in the pH Screen is typically utilized at a 0.1 M final concentration during the screening, optimization, and production of biological macromolecular crystals. It is therefore recommended that one dilute the StockOptions pH Kit buffer solution 1:10 for 1.0 M stocks and 1:5 for 0.5 M stocks to achieve a final concentration of 0.1 M. Dilution Example 1: Dilute 1 milliliter of 1.0 M StockOptions pH Screen buffer reagent to a final volume of 10 milliliters to achieve a final concentration of 0.1 M buffer. Dilution Example 2: Dilute 2 milliliter of 0.5 M StockOptions pH Screen buffer reagent to a final volume of 10 milliliters to achieve a final concentration of 0.1 M buffer.

Please note the final pH of the solution created using Stock Options may vary based upon what other reagents are added to the StockOptions pH Screen buffer.

Example 1

Crystal Screen Reagent 24 (1 ml volume in a plate reservoir)

Solution composition: 0.1 M Sodium acetate trihydrate pH 4.6, 0.2 M Calcium chloride dihydrate, 20% v/v 2-Propanol.

Suggested Stock Solutions: 100% 2-Propanol, StockOptions Sodium Acetate reagent pH 4.6, 2.0 M Calcium chloride dihydrate.

1. Pipet 600 microliters of sterile filtered deionized water into the plate reservoir.
2. Pipet 100 microliters of 2.0 M Calcium chloride dihydrate into the plate reservoir.
3. Pipet 100 microliters of 1.0 M Sodium acetate trihydrate pH 4.6 into the plate reservoir.
4. Pipet 200 microliters of 100% 2-Propanol into the plate reservoir.
5. Aspirate and dispense the solution ten times or until homogeneous.

Note: Water has been added first to enhance subsequent reagent solubility. Also note that one of the larger volumes has been added last so the pipet is already set at a large volume to enhance mixing during aspiration and dispensing.

Example 2

A custom screen reagent of 30% w/v PEG 8,000, 0.1 M Sodium acetate trihydrate pH 4.0 (10 ml)

Suggested Stock Solutions: 50% w/v PEG 8,000, StockOptions Sodium Acetate pH 4.0.

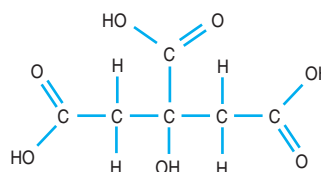
1. Pipet 3 milliliters of deionized, sterile filtered water into the tube.
2. Pipet 1 milliliter of 1.0 M Sodium acetate trihydrate pH 4.0 into the tube.
3. Pipet 6 milliliters of 50% w/v PEG 8,000 into a sterile screw top tube.

Seal the tube, and mix until the solution is homogeneous.

For Best Results

Use Hampton Research Optimize™ together with StockOptions reagents for best results. StockOptions reagents are stable at room temperature and are best if used within 12 months of receipt.

Specifications

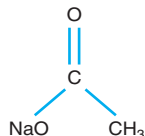


Reagent: Citric acid
C₆H₈O₇ M_r 192.13 CAS No [77-92-9] EC No 201-069-1
pH 2.2-3.8 (Reagents 1-9)
Total of 9 reagents
Titrated with Sodium hydroxide

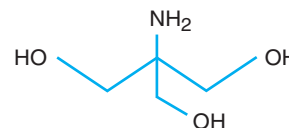
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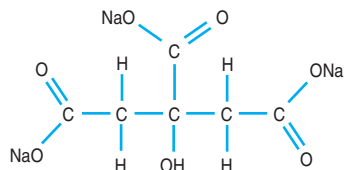
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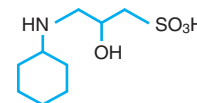
Reagent: Sodium acetate trihydrate
 $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$ M_r 136.08 CAS No [6131-90-4] EC No 204-823-8
 pH 4.0-4.8 (Reagents 10-14)
 Total of 5 reagents
 Titrated with Hydrochloric acid



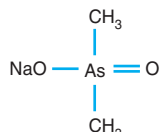
Reagent: TRIS hydrochloride
 Synonym: Tris(hydroxymethyl)aminomethane hydrochloride
 $\text{C}_4\text{H}_{11}\text{NO}_3 \cdot \text{HCl}$ M_r 157.60 CAS No [1185-53-1] EC No 214-684-5
 pH 8.0-8.8 (Reagents 30-34)
 Total of 5 reagents
 Titrated with Sodium hydroxide



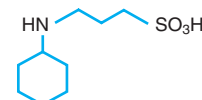
Reagent: Sodium citrate tribasic dihydrate
 $\text{C}_6\text{H}_5\text{Na}_3\text{O}_7 \cdot 2\text{H}_2\text{O}$ M_r 294.10 CAS No [6132-04-3] EC No 200-675-3
 pH 5.0-5.8 (Reagents 15-19)
 Total of 5 reagents
 Titrated with Hydrochloric acid



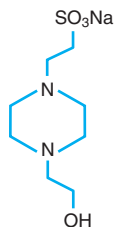
Reagent: CAPSO
 Synonym: 3-(cyclohexylamino)-2-hydroxypropanesulfonic acid
 $\text{C}_9\text{H}_{19}\text{NO}_4\text{S}$ M_r 237.32 CAS No [73463-39-5]
 pH 9.0-9.8 (Reagents 35-39)
 Total of 5 reagents
 Titrated with Sodium hydroxide



Reagent: Sodium cacodylate trihydrate
 $\text{C}_2\text{H}_6\text{AsNaO}_2 \cdot 3\text{H}_2\text{O}$ M_r 214.03 CAS No [6131-99-3] EC No 204-708-2
WARNING! Cacodylic acid is TOXIC! Refer to MSDS!
 pH 6.0-6.8 (Reagents 20-24)
 Total of 5 reagents
 Titrated with Hydrochloric acid



Reagent: CAPS
 Synonym: 3-(cyclohexylamino)-1-propanesulfonic acid
 $\text{C}_9\text{H}_{19}\text{NO}_3\text{S}$ M_r 221.32 CAS No [1135-40-6] EC No 214-492-1
 pH 10.0-11.0 (Reagents 40-45)
 Total of 6 reagents
 Titrated with Sodium hydroxide



Reagent: HEPES sodium
 Synonym: 4-(2-Hydroxyethyl)piperazine-1-ethanesulfonic acid Sodium salt
 $\text{C}_8\text{H}_{17}\text{N}_2\text{NaO}_4\text{S}$ M_r 260.30 CAS No [75277-39-3] EC No 278-169-7
 pH 7.0-7.8 (Reagents 25-29)
 Total of 5 reagents
 Titrated with Hydrochloric acid

HCl M_r 36.46
 CAS No [7647-01-0]
 EC No 231-595-7

NaOH M_r 40.00
 CAS No [1310-73-2]
 EC No 215-185-5

Reagent #	pH	Reagent	Titrant
1	2.2	1.0 M Citric acid	Sodium hydroxide
2	2.4	1.0 M Citric acid	Sodium hydroxide
3	2.6	1.0 M Citric acid	Sodium hydroxide
4	2.8	1.0 M Citric acid	Sodium hydroxide
5	3.0	1.0 M Citric acid	Sodium hydroxide
6	3.2	1.0 M Citric acid	Sodium hydroxide
7	3.4	1.0 M Citric acid	Sodium hydroxide
8	3.6	1.0 M Citric acid	Sodium hydroxide
9	3.8	1.0 M Citric acid	Sodium hydroxide
10	4.0	1.0 M Sodium acetate trihydrate	Hydrochloric acid
11	4.2	1.0 M Sodium acetate trihydrate	Hydrochloric acid
12	4.4	1.0 M Sodium acetate trihydrate	Hydrochloric acid
13	4.6	1.0 M Sodium acetate trihydrate	Hydrochloric acid
14	4.8	1.0 M Sodium acetate trihydrate	Hydrochloric acid
15	5.0	1.0 M Sodium citrate tribasic dihydrate	Hydrochloric acid
16	5.2	1.0 M Sodium citrate tribasic dihydrate	Hydrochloric acid
17	5.4	1.0 M Sodium citrate tribasic dihydrate	Hydrochloric acid
18	5.6	1.0 M Sodium citrate tribasic dihydrate	Hydrochloric acid
19	5.8	1.0 M Sodium citrate tribasic dihydrate	Hydrochloric acid
20	6.0	1.0 M Sodium cacodylate trihydrate	Hydrochloric acid
21	6.2	1.0 M Sodium cacodylate trihydrate	Hydrochloric acid
22	6.4	1.0 M Sodium cacodylate trihydrate	Hydrochloric acid
23	6.6	1.0 M Sodium cacodylate trihydrate	Hydrochloric acid
24	6.8	1.0 M Sodium cacodylate trihydrate	Hydrochloric acid
25	7.0	1.0 M HEPES sodium	Hydrochloric acid
26	7.2	1.0 M HEPES sodium	Hydrochloric acid
27	7.4	1.0 M HEPES sodium	Hydrochloric acid
28	7.6	1.0 M HEPES sodium	Hydrochloric acid
29	7.8	1.0 M HEPES sodium	Hydrochloric acid
30	8.0	1.0 M TRIS hydrochloride	Sodium hydroxide
31	8.2	1.0 M TRIS hydrochloride	Sodium hydroxide
32	8.4	1.0 M TRIS hydrochloride	Sodium hydroxide
33	8.6	1.0 M TRIS hydrochloride	Sodium hydroxide
34	8.8	1.0 M TRIS hydrochloride	Sodium hydroxide
35	9.0	0.5 M CAPSO	Sodium hydroxide
36	9.2	0.5 M CAPSO	Sodium hydroxide
37	9.4	0.5 M CAPSO	Sodium hydroxide
38	9.6	0.5 M CAPSO	Sodium hydroxide
39	9.8	0.5 M CAPSO	Sodium hydroxide
40	10.0	0.5 M CAPS	Sodium hydroxide
41	10.2	0.5 M CAPS	Sodium hydroxide
42	10.4	0.5 M CAPS	Sodium hydroxide
43	10.6	0.5 M CAPS	Sodium hydroxide
44	10.8	0.5 M CAPS	Sodium hydroxide
45	11.0	0.5 M CAPS	Sodium hydroxide

Technical Support

Inquiries regarding StockOptions pH Kit reagent formulation, interpretation of screen results, optimization strategies and general inquiries regarding crystallization are welcome. Please e-mail, fax, or telephone your request to Hampton Research. Fax and e-mail Technical Support are available 24 hours a day. Telephone technical support is available 8:00 a.m. to 4:30 p.m. USA Pacific Standard Time.

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