

January 2008 Information Sheet R010: Recommended & Alternative TOC Standard Solutions for BioTector

Potassium Hydrogen Phthalate (KHP) Recommended TOC Standard Solution for BioTector

Preparation of KHP Standard Solution:

Formula:	$C_8H_5KO_4$		
Carbon, 12	x8	=	96
Oxygen, 16	x4	=	64
Potassium, 39	x 1	=	39
Hydrogen, 1	x5	=	5
Total weight		=	204.22 g/mol

47% of KHP is Carbon. Purity of the Potassium KHP is 99.9%.

Therefore to prepare a 1000 mgC/l standard solution, add 2.13g of KHP in a flask and add enough DIW to make it 1 litre solution. Note that the quantities required change with the % purity of the chemical used.

Table below gives the quantities required at various % purity of KHP.

% Purity of KHP	Quantity of KHP (grams) to prepare 1000 mgC/l Standard
100	2.127
99.9	2.129
99.5	2.138
99.0	2.149
95.0	2.239
90.0	2.364

To prepare solutions containing more than 1000 mgC/l, the required solvent can be added directly:

KHP Standard Solution Concentration (mgC/l)	Quantity of 99.9% KHP (grams) to be added 1 Litre DIW
1000	2.129
1250	2.661
1500	3.194
2000	4.258
5000	10.645
10000	21.290

Standard solutions containing less than 1000 mgC/l should be prepared using dilution technique. For instance, to prepare 100 mgC/l solution, weigh 100 grams of 1000 mgC/l solution in an Erlenmeyer flask. Add the 100 grams in a 1000 ml (± 0.4 ml) long neck flask. Fill the rest of the flask with deionised water to make it exactly 1000 ml. Mix the flask thoroughly. This flask contains 100 mgC/l solution.

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Acetic Acid (ACA)
Alternative TOC Standard Solution for BioTector

Preparation of AcA Standard Solution:

Formula:	C ₂ H ₄ O ₂		
Carbon, 12	x2	=	24
Oxygen, 16	x2	=	32
Hydrogen, 1	x4	=	4
Total weight		=	60.0524 g/mol

39.97% of Acetic Acid is Carbon. Purity of the available Acetic Acid 1000 is 99.8%.

Therefore in order to prepare a 1,000 mgC/l solution from 99.8% Acetic Acid, add 2.507g of Acetic Acid in 1,000 ml of deionised water.

Quantities of Acetic acid (with different purities) required (in 1000 ml deionised water) to prepare 1000 mgC/l solutions.

% Purity of Acetic Acid	Quantity of Acetic Acid (grams)
100	2.502
99.8	2.507
99.5	2.515
99	2.527
95	2.634
90	2.780

Standard solutions containing less than 1000 mgC/l should be prepared using dilution technique. For instance, to prepare 100 mgC/l solution, weigh 100 grams of 1000 mgC/l solution in an Erlenmeyer flask. Add this 100 grams in a 1000 ml (±0.4 ml) long neck flask. Fill the rest of the flask with deionised water to make it 1000 ml. Mix the flask thoroughly. This flask contains 100 mgC/l solution. To prepare 10 mgC/l solution, weigh 10 grams of 1000 mgC/l solution in an Erlenmeyer flask. Add this 10 grams in a 1000 ml (±0.4 ml) long neck flask. Fill the rest of the flask with deionised water to make it 1000 ml. Mix the flask thoroughly. This flask contains 10 mgC/l solution.

To prepare solutions containing greater than 1000 mgC/l add the required amount of solvent directly:

Standard Solution (mgC/l)	Quantity of 99.8% Acetic Acid to be added in 1000 ml Deionised Water (grams)
1000	2.507
1250	3.134
1500	3.760
2000	5.014
5000	12.535
10000	25.070

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