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ProductInformation

MES SODIUM SALT
Product Number **M 3885, M 5057 and M 3058**
Store at Room Temperature

CAS #: 71119-23-8
Synonyms: 2-(N-Morpholino)ethanesulfonic acid, sodium

Product Description
Appearance: crystalline white powder
Molecular formula: $C_6H_{12}NO_4SNa$
Molecular weight: 217.2
Melting point: free acid decomposes above 300°C[2]
pK_a= 6.10 at 25°C[2,3]
Useful buffering range: pH 5.5-6.7
$\Delta pK/\Delta T$ = -0.011[3]
Metal binding constants (log K) at 20°C, for 0.1 M solution: Mg^{2+}, 0.8; Ca^{2+}, 0.7; Mn^{2+}, 0.7; Cu^{2+}, negligible[2,4]

MES is one of a number of so-called "Good" buffers developed for biological applications, with the criteria: midrange pK_a, maximum water solubility and minimum solubility in all other solvents, minimal salt effects, minimal change in pK with temperature, chemically and enzymatically stable, minimal absorption in visible or UV spectral range and reasonably easily synthesized.[2]

M 5057, SigmaUltra, is tested for trace ions.

M 3058 is Biotechnology Performance Certified (Suitable for electrophoresis, tissue culture, and molecular biology applications.)

A buffer using MES free acid can be prepared by titrating the free acid with sodium hydroxide to the desired pH ($pK_a \pm 1$). Alternatively, volumes of equimolar solutions of MES free acid and MES Sodium can be mixed to attain the desired pH. Standard mixing tables using stock solutions to prepare a buffer of a given pH have been published.[4]

Preparation Instructions
MES Sodium is soluble in water, giving a clear colorless solution at 25 g in 50 mL water (approx. 2.3 M).[1] The pH of a solution should be between 9 and 10, depending on concentration.

Solutions should be stable at 2-8 °C for months. Sterilization should be by filtration through 0.2 μm filters. Autoclaving is not recommended. If buffers must be nuclease-free, it is best to treat the water, then add the buffer solids after autoclaving. When MES solutions are autoclaved, they turn yellow (although pH does not change measurably). The identity of the yellow breakdown product is unknown.[1]

References
1. Sigma quality control.
2. Good, Norman E. et al., *Biochemistry*, 5, 467-477 (1966).
3. *Methods in Enzymology*, 182, 24-38 (1990).
4. *Data for Biochemical Research*, 3rd Ed., eds. Dawson, R.M.C. et al. (Oxford Press, 1987), p. 410, 424, 431.

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