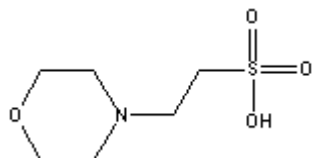


Catalog Number: 152453, 152454, 195309, 194835

MES

Structure (free acid):



	Free Acid	Potassium Salt	Sodium Salt
Molecular Formula	C ₆ H ₁₃ NO ₄ S • H ₂ O	C ₆ H ₁₂ NO ₄ SK	C ₆ H ₁₂ NO ₄ SNa
Molecular Weight	213.2	233.3	217.2
CAS #	4432-31-9	39946-25-3	711119-23-8
pH (~1% solution)	2.5 to 5.0	9.0 to 10.5	8.5 to 10.5

Synonym: 2-[N-Morpholino] ethanesulfonic acid, sodium salt

pKa: 6.1 @ 25° C

Useful pH Range: 5.5 – 6.7

ΔpH/ΔT: -0.011²

Metal Binding Constants (log K) @ 20° C for 0.1 M Solution^{1,3}:

Mg²⁺: 0.8

Ca²⁺: 0.7

Mn²⁺: 0.7

Cu²⁺: negligible

Physical Description: White crystalline powder

Solubility: Soluble in water (0.5 M or higher yields a clear and colorless solution). A saturated solution of the free acid form at 0° C is approximately 0.65 M.¹ Sterilization should be done by filtration through a 0.2 micron filter. Autoclaving is not recommended. Autoclaving yields an unidentified yellow by-product.

Description: A zwitterionic buffer. One of the "Good" buffers developed for biological applications. It has the advantages of:

- midrange pKa
- 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

Typical Buffer Preparation: A buffer using MES free acid can be prepared by titrating the free acid with sodium hydroxide to the desired pH (pKa \pm 1). Alternatively, volumes of equimolar MES free acid and sodium or potassium MES can be mixed to attain the desired pH. Standard mixing tables for stock solutions can be found in *Data for Biochemical Research*.³

Availability:

Catalog Number	Description	Size
195309	MES, free acid, monohydrate	10 g 25 g 100 g 250 g 1 kg
194835	MES, free acid, monohydrate, molecular biology reagent	10 g 25 g 100 g 250 g
152453	MES, potassium salt	10 g 25 g 100 g
152454	MES, sodium salt	10 g 25 g 100 g

References:

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

4. Sambrook, et al. (eds), *Molecular Cloning: A Laboratory Manual*, **2nd Ed.**, Cold Spring Harbor Press (1989).
5. *Methods in Enzymology*, **v. 87**, 405 (1982).