

Technical Data Sheet

PIPES Biological Buffer

#19230

1,4 Piperazine bis (2-ethanosulfonic acid)

Useful pH range: 6.4 - 7.2

PIPES is a hydrogen-ion organic-based buffer, used in the preparation of a variety of mammalian tissues for EM. It produces excellent results in the preservation of ultrastructural details, especially when long fixation is required. This buffer does not appear to contribute extraneous anions or cations to the tissue, thus permitting elemental determinations by means of energy dispersive X-Ray analysis.

Baur, et al., have demonstrated that the ultrastructural aspects of various tissues (human skin, human hypertrophic scars, mollusc neuronal tissue, oyster gill, hamster ovary, cell in culture, rat skin, lung and skeletal muscle, and canine cardiac muscle) fixed with NaOH-PIPES-buffered glutaraldehyde solution were of superior quality with more detail between organelles. The cytoplasm is more homogeneous in consistency, mitochondria is very electron-dense, microfilaments and microtubules are more commonly observed in PIPES tissue and to a lesser degree in phosphate-treated cells.

The following procedure is recommended:

- Fixation for 24 to 48 hours in a 3% glutaraldehyde, 0.1M PIPES solution buffered with NaOH to pH 7.6.
- Rinse the PIPES buffer for 20 minutes, using three changes.
- Post fixation is with 1% OsO₄ with 0.1M PIPES buffer for 1 - 2 hours.
- 19230 - PIPES - C₈H₁₈N₂O₆S₂ M.W. 353.3 - 25G

Reference:

Good, N.E., et al., J. Biochem. 5, 467 - 1966 Baur, P.S., et al., J. of Microscopy, 109, 315 - 1977