

## Product Information

### Glutaraldehyde solution

Grade I, 8% in H<sub>2</sub>O, specially purified for use as an electron microscopy fixative or other sophisticated use

Catalog Number **G7526**

Storage Temperature -20 °C

### Product Description

Molecular Formula: C<sub>5</sub>H<sub>8</sub>O<sub>2</sub>

Molecular Weight: 100.12

CAS Number: 111-30-8

Density: 1.016 g/ml

Glutaraldehyde is also referred to as glutaral, 1,5-pentanedione, potentiated acid glutaraldehyde, sonacide, and glutardialdehyde. This product is supplied as an 8% solution in water. The concentration determined by titration with hydroxylamine HCl is a weight/weight (w/w) percentage.

Pure monomeric glutaraldehyde has an absorbance peak at 280 nm and the main impurity, possibly a polymer, has an absorbance peak at 235 nm.<sup>1</sup> Monomeric glutaraldehyde may be purified from polymeric glutaraldehyde by treatment with charcoal (5% w/v) and subsequent filtration (3-4 times).<sup>2</sup> Untreated glutaraldehyde has an absorption at 235 nm that is 5 times greater than that at 280 nm, whereas, after three washings the values are about equal. Glutaraldehyde is a bifunctional cross-linking reagent, reacting with NH<sub>2</sub> groups to form Schiff's bases.<sup>3</sup>

Commercial 25% aqueous solutions at approximately pH 3 contain 3% glutaraldehyde, the hemiacetal and polymers of the latter. At neutral or slightly alkaline pH, other polymers form, the length increasing with pH, until a precipitating complex forms.<sup>3</sup>

Glutaraldehyde is a disinfectant, which is rapidly effective against vegetative forms of Gram-positive and Gram-negative bacteria. It is also effective against acid-fast bacteria, bacterial spores, some fungi and viruses, including hepatitis B virus and human immunodeficiency virus.<sup>4,5</sup>

2% aqueous solutions are efficient as bacteriocidal and sporicidal agents within 15-30 minutes.<sup>6</sup> However, other references indicate two to three hours of exposure to the 2% solution were required to *kill B. subtilis*, *C. tetani* or *C. perfringens* (examples of sporicidal activity).<sup>7</sup> Other extensive information about usage for sterilization can be found in the above reference. The authors also indicate that a 1-2% glycine solution can be used as an inactivator of glutaraldehyde, since glycine is effective and generally nontoxic.

This product has been specially purified for use as an electron microscopy fixative or for other sophisticated uses, such as cell fixation.<sup>8-11</sup> For fixing tissue for electron microscopy, the concentration of glutaraldehyde should be 1.5%. Any of the Grade I aqueous glutaraldehyde solutions can be used, but they need to be diluted with buffer down to a 1.5% final concentration.<sup>12</sup> An example of one buffer composition is: 1% formaldehyde, 1.5% glutaraldehyde, 0.1% magnesium chloride, and 0.05% calcium chloride (final concentrations; pH will vary depending on the tissue being fixed).

This product can also be used for stabilization of proteins on agarose beads,<sup>13</sup> activation of polystyrene and glass for immobilization of antibodies and antigens,<sup>14</sup> and coupling peptides onto carrier proteins.<sup>15</sup> Additional references for use as a crosslinking agent are available.<sup>15-20</sup>

### Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

### Storage/Stability

Purified samples of 8% glutaraldehyde stored at -20 °C showed virtually no change in their UV absorbance characteristics even after 8 months.<sup>1</sup> However, solutions are very heat sensitive.

### References

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