



3050 Spruce Street  
Saint Louis, Missouri 63103 USA  
Telephone 800-325-5832 • (314) 771-5765  
Fax (314) 286-7828  
email: techserv@sial.com  
sigma-aldrich.com

## Product Information

### TWEEN® 80 solution

Product Number **P6224**  
Store at Room Temperature

#### Product Description

CAS Number: 9005-65-6  
Specific gravity: 1.07 (25 °C)  
HLB (hydrophile-lipophile balance) value: 15.0<sup>1,2</sup>  
Critical Micellar Concentration (CMC): 13-15 mg/liter<sup>1,3</sup>  
Brookfield Viscosity: 400-620 cps (25 °C, neat)  
Micelle molecular weight: 76 kDa<sup>3</sup>  
Synonyms: Polysorbate 80, PEG (80) sorbitan monooleate, polyoxyethylenesorbitan monooleate

TWEEN 80 is a polyethylene sorbitol ester, with a calculated molecular weight of 1,310 daltons, assuming 20 ethylene oxide units, 1 sorbitol, and 1 oleic acid as the primary fatty acid.<sup>4</sup> Fatty acid constituents of this product are determined by transesterification to yield fatty acid methyl esters, which are identified by gas chromatography.

TWEEN 80 has been widely used in biochemical applications including: solubilizing proteins, isolating nuclei from cells in culture,<sup>5</sup> growing of tubercule bacilli,<sup>6</sup> and emulsifying and dispersing substances in medicinal and food products. It has little or no activity as an anti-bacterial agent<sup>1</sup> except it has been shown to have an adverse effect on the antibacterial effect of methyl paraben and related compounds.<sup>7</sup> Polysorbates have been reported to be incompatible with alkalis, heavy metal salts, phenols, and tannic acid. They may reduce the activity of many preservatives.<sup>8</sup>

Product No. P 6244 is produced solely from plant or synthetic raw material feedstocks and does not contain animal derived materials of any kind. Sigma also offers these additional TWEEN 80 products.  
P1754 - for general use.  
P 4675 and P 4780 - tested in cell culture applications.  
P 5188 - tested in molecular biology applications.  
P 8074 - SigmaUltra - extensively tested for trace metals.

#### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

#### Preparation Instructions

TWEEN 80 is miscible in water (0.1 ml/ml). It is reported to be miscible with alcohol, cottonseed oil, corn oil, ethyl acetate, methanol, and toluene, but insoluble in mineral oil.<sup>4</sup> The pH of a 1% aqueous solution is 5.5-7.2.

#### Storage/Stability

Aqueous solutions of polysorbates as well as the neat liquid will undergo autoxidation over time, with changes being catalyzed by light, increased temperature, and copper sulfate.<sup>9</sup> Solutions are reasonably stable at 2 - 8 °C for short periods. For special applications, storage under argon or nitrogen may be preferred.

The product is not sterile. Autoclaving of solutions is generally not advised. Sterile filtration is more easily done if the liquid is warmed to about 40 °C and alternate portions of hot distilled water and TWEEN 80 are poured through the 0.22 µm filter. The TWEEN 80 will blend and remain in solution.

#### References

1. Data for Biochemical Research, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), p. 289.
2. Neugebauer., J. M., Detergents: An overview. *Methods Enzymol.*, **182**, 247 (1990).
3. Protein Purification Methods: A Practical Approach., Harris, E. L. V., and Angal, S., eds., IRL Press at Oxford University Press (New York, NY: 1990), p. 71.
4. The Merck Index, 11th Ed., Entry #7559.
5. Fisher, H. W. and H. Harris, *Proc. R. Soc. B*, **156**, 521 (1962).
6. Dubos, R. J. and B.D. Davis, *J. Exp. Med.*, **83**, 409 (1946).

7. Disinfection, Sterilization & Preservation, 4th Ed., Block, S.S. (Lea & Febiger Pub., 1991) Chapter 4.
8. Martindale: The Extra Pharmacopoeia, 30th Ed., Reynolds, J. E. F., ed., Pharmaceutical Press(London, England: 1993) p. 1030.

9. Donbrow, M., et al., Autoxidation of polysorbates. J. Pharm. Sci., **67**, 1676-1681 (1978).

TWEEN is a registered trademark of Uniqema, a business unit of ICI Americas Inc.

RLG 9/07

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.