

## Product Information

### TWEEN<sup>®</sup> 80

Product Number **P 5188**  
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. Typically the fatty acid composition is approximately 70% oleic acid with several other fatty acids such as palmitic acid indicated.

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 5188 is designated as Molecular Biology grade and is suitable for molecular biology applications. It has been analyzed for the absence of endonuclease-exonuclease and RNase.

Sigma also offers these additional TWEEN 80 products.

P 1754 - for general use.

P 4675 and P 4780 - tested in cell culture applications.

P 8074 - SigmaUltra - extensively tested for trace metals.

P 6224 - non animal source.

#### 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) yielding a clear to slightly hazy faint yellow solution. 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

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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).

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