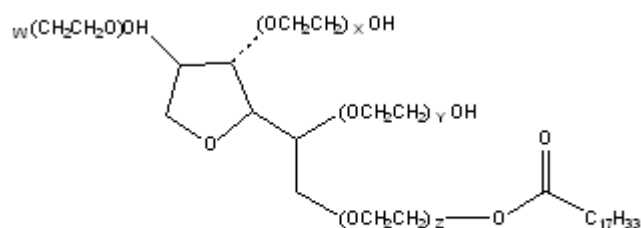


Catalog Number: 103168, 103169, 103170, 103171, 152487, 194724, 194725, 194841, 194842, 806576

## Tween®

Structure (Tween® 80):<sup>19</sup>



where sum of w, x, y and z = 20

**Description:** Tweens® are a series of nonionic surfactants derived from sorbitan esters. They are soluble or dispersible in water but differ widely in organic and oil solubilities. Used as oil-in-water emulsifiers in pharmaceuticals, cosmetics, cleaning compounds, etc. (Not sold by MP for human use).

	Polysorbate 20	Tween® 40	Tween® 60	Tween® 80	Tween® 85
CAS #	9005-64-5	9005-66-7	9005-67-8	9005-65-6	9005-70-3
Synonym	Polyoxyethylene-sorbitan monolaurate; Polysorbate 20	Polyoxyethylene-sorbitan monopalmitate; ; Polysorbate 40	Polyoxyethylene-sorbitan monostearate; Polysorbate 60	Polyoxyethylene-sorbitan monooleate; Polysorbate 80	Polyoxyethylene-sorbitan trioleate; Polysorbate 85
Content	~55% lauric acid (remainder primarily myristic, palmitic and stearic acid)	~90% palmitic acid	~55% stearic acid (remainder primarily palmitic acid)	~75% oleic acid	~70% oleic acid (remainder primarily elaidic, linolenic and palmitic acids)
Specific Gravity	~1.1 g/ml	~1.08 g/ml	~1.1 g/ml	~1.08 g/ml	~1.0 g/ml

Viscosity @ 25° C	400 cps	600 cps	--	400 cps	300 cps
Acid No.	0-2.0	0-2.0	0-2.0	0-2.0	0-2.0
Saponification No.	40-50	43-49	45-55	45-55	83-93
Hydroxyl No.	96-108	89-105	81-96	65-80	39-52
Water	2.5-3.0%	2.5-3.0%	2.5-3.0%	2.5-3.0%	4.8-5.2%
Critical Micelle Concn. (CMC)	0.06 mM (60 mg/L or $6 \times 10^{-3}$ mole/L)	--	--	0.012 mM (13-15 mg/L)	--
Molecular Weight	1228	--	1311.7	1310	--

**Physical Description:** Yellow, oily liquid

**Typical Usage:**

Polysorbate 20 is typically used as an emulsifying agent for the preparation of stable oil-in-water emulsions, particularly in pharmaceutical applications.<sup>17</sup> Polysorbate 20 has been used in pre-extraction of membranes to remove peripheral proteins (used at 2% for extraction of membrane-bound proteins).<sup>1,10,12</sup> Several resources may be helpful in determining usage concentrations.<sup>8,9,14</sup> Polysorbate 20 has been used as a blocking agent on nitrocellulose at a typical concentration of 0.05%.

Tween® 40 can be used as a non-ionic detergent in cell lysis, nuclei isolation and cell fractionation.<sup>2,13,15</sup>

Tween® 80 has been widely used in biochemical applications including: solubilizing proteins, isolating nuclei from cells in culture<sup>4,7,15</sup>, selective protein extraction<sup>4,15</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>3</sup> It has been shown to have an adverse effect on the antibacterial effect of methyl paraben and related compounds.<sup>16</sup>

**Critical Micelle Concentration (CMC):** Detergents with high CMC values are generally easy to remove by dilution; detergents with low CMC values

are advantageous for separations on the basis of molecular weight. As a general rule, detergents should be used at their CMC and at a detergent-to-protein weight ratio of approximately ten.<sup>19-20</sup>

**Solubility:** Soluble/miscible in water to give a clear yellow solution; miscible with alcohol, dioxane, and ethyl acetate; practically insoluble in liquid paraffin and fixed oils (such as mineral oil).<sup>17</sup> Autoclaving of solutions is not recommended. Sterile filtering is suggested with a 0.22 micron filter. Tween® may need to be warmed to about 40° C and alternated with portions of hot distilled water while being poured through the filter.

**Availability:**

Catalog Number	Description	Size
103168	Polysorbate 20	100 ml 500 ml 1 liter
194724	Polysorbate 20, cell culture reagent	100 ml 500 ml 4 liter
806576	Polysorbate 20	100 g
194841	Polysorbate 20, molecular biology reagent	50 ml 100 ml
103169	Tween® 40	100 ml 500 ml
103171	Tween® 60	100 ml 500 ml 1 liter
103170	Tween® 80	100 ml 500 ml 1 liter 4 liters 5 liters
194725	Tween® 80, cell culture reagent	100 ml 500 ml 4 liters
194842	Tween® 80, molecular biology reagent	50 ml 100 ml
152487	Tween® 85	100 ml 500 ml 4 liters

## References:

1. Black, P.N., et al., *J. Biol. Chem.*, v. **262**, 1412–1419 (1987).
2. Culvenor, J.G., et al., "Characteristics of plasma membrane isolated from a mouse T lymphoma line: comparison after nitrogen cavitation, shearing, detergent treatment, and microvesiculation." *J. Cell. Biochem.*, v. **20**, 127–138 (1982).
3. Dawson, et al. (eds.), *Data for Biochemical Research, 3rd Ed.*, Oxford Press, p. 289 (1989).
4. Deshpande, R.G., et al., "Isolation of a contact-dependent haemolysin from Mycobacterium tuberculosis." *J. Med. Microbiol.*, v. **46**, 233–238 (1997).
5. Donbrow, M., et al., *J. Pharmaceutical Sciences*, v. **67**, 1676–1681 (1978).
6. Dubos, R.J. and Davis, B.D., *J. Exp. Med.*, v. **83**, 409 (1946).
7. Fisher, H.W. and Harris, H., *Proc. R. Soc. B*, v. **156**, 521 (1962).
8. Harris and Angal (eds.), *Protein Purification Methods: A Practical Approach*, IRL Press (1989).
9. Harris and Angal (eds.), *Protein Purification Applications: A Practical Approach*, IRL Press (1989).
10. Helenius, A. and Simons, K., *Biochem. Biophys. Acta*, v. **455**, 796 (1976).
11. Helenius, A., et al., *Methods in Enzymology*, v. **56**, 734–749 (1979).
12. Karasawa, et al., *J. Biol. Chem.*, v. **274**, 8655–8661 (1999).
13. Link, A.J. (ed.), *2-D Proteome Analysis Protocols, v. 112, Methods in Molecular Biology*, Humana Press: Totowa, NJ (1999).
14. Neugebauer, J.M., *Methods in Enzymology*, v. **182**, 239 (1992).
15. Storrie, B and Madden, E.A., "Isolation of subcellular organelles." *Methods Enzymol.*, v. **182**, 203–225 (1990).
16. *Disinfection, Sterilization & Preservation, 4th Ed.*, Block, S.S. (Lea & Febiger Pub.) Chapter 4 (1991).
17. *Martindale: The Extra Pharmacopoeia, 30th Ed.*, Pharmaceutical Press, p. 1030, 1247 (1993).
18. *Sys. Analysis of Surface Active Agents, 2nd Ed.*, p. 533.
19. Womack, M.D., et al., *Biochim. Biophys. Acta*, v. **733**, 210 (1983)
20. Matson, R.S. and Goheen, S.C., *LC-GC*, v. **4(7)**, 624 (1986)
21. *Merck Index, 12th Ed.*, No. 7742.

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