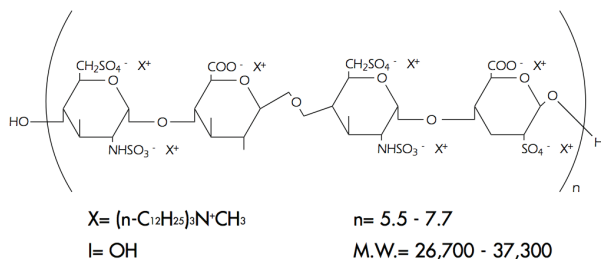


TECHNICAL DATA SHEET 172

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TDMAC-Heparin Complex

Tridodecyl methyl ammonium chloride-heparin complex -- simply written as TDMAC-heparin (T-H) -- is an organic compound containing approximately 22% of the heparinate moiety. This corresponds to a sulfur analysis of about 3.3% and is based on the following repeat unit:



The use of heparin bonded to various surfaces was first described by Gott using a graphite-benzal-konium chloride-heparin (GB4)¹, which however had certain disadvantages: lack of transparency and flaking tendency. Battelle Laboratories^{2,3} overcame these disadvantages and Polysciences has made available the transparent coating using T-H. The mechanism of this coating to a surface may be due to the large number of Van Der Waals forces produced by the lipophilic chains of tridodecyl methyl ammonium groups.

The solvent of choice for T-H coatings is toluene-petroleum ether (BP 70-96°C) 50:50 v/v. The T-H solution supplied is not sterile and should be filtered through a 0.22-10 μ polypropylene filter. The T-H solution supplied can be used to coat surfaces⁴ made of PVC, polyurethane, silicone, mylar, dacron, or polycarbonate, by simple immersion for a few minutes. To coat surfaces made of polyethylene and polypropylene, longer periods and elevated impregnation temperatures (40-50°C) are often helpful. A teflon surface can be coated by refluxing in the T-H solution for 2-3 hours. The choice of solution concentration (2.5 or 7% w/w), in the 1:1, v/v toluene-petroleum ether solution will depend on the desired thickness of the coating. For tubing or catheters with a small lumen, it is advisable to use 2% T-H to avoid further restriction of the inside diameter. For non-enclosed coated surfaces, 1-3 hours of air drying should be enough. Enclosed areas can be dried by blowing a dry stream of filtered nitrogen through the enclosed area for 5-20 minutes. After drying, the device can be sterilized by autoclaving if the substrate will take the treatment, or by ethylene oxide gas sterilization. If ethylene oxide is used, outgassing procedures are advised. TDMAC-heparin has also been used⁵ in many heparin sensors.

PRECAUTIONS

WARNING! FLAMMABLE. Keep container tightly closed. Keep away from heat, sparks and open flame. Use with adequate ventilation. Store at 4-8°C. Avoid contact with skin and eyes. Avoid inhalation of vapors.

FIRST AID

In case of eye contact, flush with plenty of water. Call a physician. In case of skin contact, wash with soap and water. In case of inhalation, remove to fresh air.

ORDERING INFORMATION:

| Cat. # | Description | Size |
|--------|----------------------------------|------------------------------|
| 03921 | TDMAC-Heparin, 2% (w/w) solution | 50mL |
| 03813 | TDMAC-Heparin, 7% (w/w) solution | 25mL |
| 01595 | TDMAC, 100% | 5g 25g |
| 01491 | Heparin, Sodium | 100m units 5 x 100m units |

REFERENCES

- Gott, V.L., et al, Science, 142, 1297 (1963).
- Grode, G.A., et al, Trans. Am. Soc. Artif. Int. Organs, 15, 1 (1969).
- Leininger, R.I., et al, Trans. Am. Soc. Artif. Int. Organs, 18, 312 (1972).
- Biomaterials 18, 421 (1997); U.S. Patent 5441759; Jap. Pat. 07184988; Jap. Pat. 06184265; World Pat. W09200747; J. Pharmacol. Meth 23, 7 (1990); European Pat. 338418; Biomaterials 5, 27 (1984); J. Biomed. Mater. Res., 7, 145 (1973)
- Analytical Chem. 71, 4614 (1999) and references therein

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