

INTRODUCTION

Biomedical Applications: TDMAC

(Tridodecylmethylammonium chloride, *Figure 1*), a quaternary ammonium cation surfactant is highly soluble in various solvents and is widely used in heparinization processes to produce thromboresistant materials to be used in contact with blood in the vascular system. Another important application is to bond anionic antibiotic non-covalently in prosthetic materials.

Chemical Applications : TDMAC is able to generate positive charges on carbon atoms in graphene sheets via intermolecular charge transfer, and produces a precipitate that's a complex of graphene oxide. This graphene-TDMAC material shows electrocatalytic activity and catalytic activity. The ion-selective electrodes (ISEs; membrane electrodes) are electrochemical sensors useful in various analytical applications. TDMAC used as a polymer membrane-based electrode exhibits significant potentiometric response to heparin in the clinically relevant concentration range. Currently, the electrode substrates containing TDMAC are used as potentiometric sensors for detecting bisphenol A.

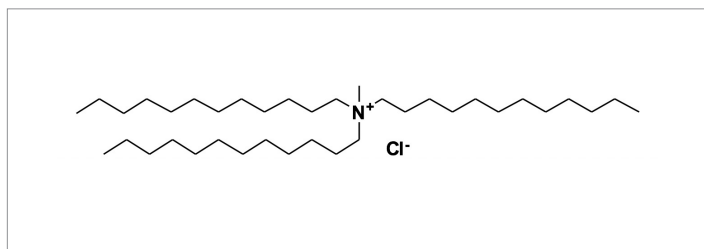
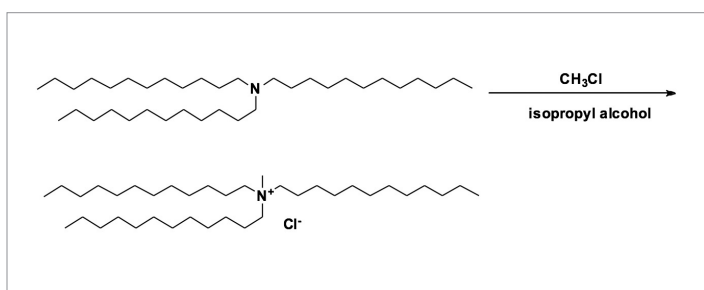


Figure 1: TDMAC Chemical Structure



Scheme 1: Synthetic route of TDMAC

MANUFACTURING

TDMAC is a quaternary ammonium salt, mainly produced by quaternization of Tridodecylamine and chloromethane in pressurized reactor (*Scheme 1*).

BIOMEDICAL TDMAC BY POLYSCIENCES

Because biomedical applications require specialized grades, approved additives, documented processes and characterization to meet specific release profiles and regulatory requirements, they are often not well served by large scale industrial manufacturers.

In addition to the retail products noted below (Ordering Information), Polysciences offers TDMAC produced at further regulatory tiers to meet the customized needs of medical device manufacturers and pharmaceutical companies. These grades are prepared with the appropriate cGMP documentation and traceability, the option of including no additives or customized additive packages, and full characterization employing state-of-the-art analytical techniques

POLYSCIENCES TDMAC MANUFACTURING CAPABILITIES

Polysciences has batch processing capabilities to produce TDMAC lot sizes ranging from 1 kg to 10 kg. Such smaller-scale processes allow for the tailored preparation of TDMAC to meet the needs of specific applications. We are pleased to offer our scientific and technical expertise, strong ISO 13485:2016 Quality Management System and cGMP capabilities to our partners in the pharmaceutical and medical device industries.

REFERENCES

- Desjardins, S. C. (2016). *Indwelling vascular cannulas for remote blood sampling, infusion, and long-term instrumentation of small laboratory animals*. *Methods of Animal Experimentation*, 2, 143-194.
- Ferguson, S. A., & Meyerhoff, M. E. (2017). *Characterization and quantification of polyquaterniums via single-use polymer membrane-based polyanion-sensitive electrodes*. *ACS Sensors*, 2(2), 268-273.
- Grill, W. M., & Mortimer, J. T. (1994). *Electrical properties of implant encapsulation tissue*. *Annals of Biomedical Engineering*, 22(1), 23-33.

Ruggieri, M. R., Hanno, P. M., & Levin, R. M. (1987). *Reduction of bacterial adherence to catheter surface with heparin*. The Journal of Urology, 138(2), 423-426.

Spinale, F. G., Hendrick, D. A., Crawford, F. A., Smith, A. C., Hamada, Y. O. S. H. I. R. O., & Carabello, B. A. (1990). *Chronic supraventricular tachycardia causes ventricular dysfunction and subendocardial injury in swine*. American Journal of Physiology-Heart and Circulatory Physiology, 259(1), H218-H229.

Stroncek, J. D., Ren, L. C., Klitzman, B., & Reichert, W. M. (2012). *Patient-derived endothelial progenitor cells improve vascular graft patency in a rodent model*. Acta Biomaterialia, 8(1), 201-208.

ORDERING INFORMATION

Cat. #	Description	Unit Size
01595	TDMAC	1g, 5g, 25g
03813	TDMAC-heparin 7%	25ml
03921	TDMAC-heparin 2%	50ml

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