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Acryloxyalkyltriethylammonium bromides (AATEABs): useful starting materials for the preparation of polymeric membrane coatings with anti-biofouling properties

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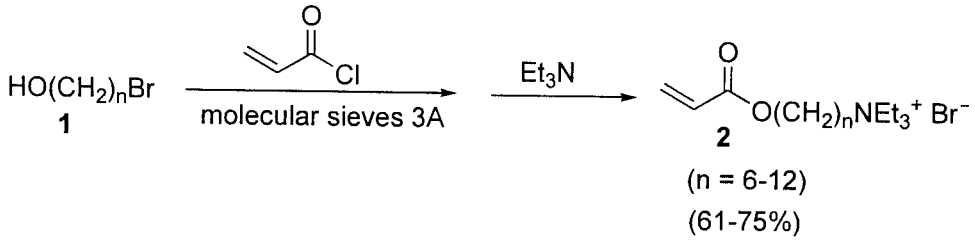
Polymerizable quaternary ammonium salts (PQASs) are important starting materials for the development of innovative polymers with antimicrobial activity. We report herean efficient synthetic approach for the preparation of a particularly important class of PQASs, that are, acryloxyalkyltriethylammonium bromides (AATEABs)**2**, which may find application for the development of antimicrobial coatings for commercial membranes with antifouling and anti-biofouling properties. The synthetic approach for the production of AATEABs**2** bearing an alkyl chain of 6, 9, 11, and 12 carbon atoms (Scheme 1) is based on a simple two-step procedure from commercially available substrates**1**, entirely carried out under air and without any need for chromatographic purification.



Scheme 1

All the newly synthesized AATEABs were tested for their antimicrobial activity, and the results evidenced that AATEABs bearing an alkyl chain of 11 and 12 carbon atoms (AUTEAB and ADTEAB, respectively) possessed significant activity against Gram +ve bacteria and yeast strains. Accordingly, these derivatives are excellent candidates for the industrial development of novel antimicrobial polymers and materials. In particular, we have efficiently employed AUTEAB and ADTEABfor the development of novel polymeric coatings for the surface functionalization of commercial membranes. The novel nanostructured membranes thus obtained are characterized by significant anti-fouling and anti-biofouling properties, and can be efficiently employed in industrial wastewater treatment.

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