

A new and rapid method for preparing long-chain alkyltrimethylammonium salts with a variety of counterions

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A new, rapid, and simple method for preparing long-chain alkyltrimethylammonium (A1TA+X-) or long-chain alkylpyridinium (A1Py+X-) salts (X- = F-, Cl-, Br-, NO3-, SO42-, PO42-, carboxylic anions, etc.) is presented. The method is based on the preparation of a water-insoluble xanthate formed between an A1TA+X- or an A1Py+X- (X- = Cl- or Br-) with an alkyl xanthate followed by decomposition of the xanthate in acidic medium according to the reaction: A1TA+(xanthate) + H+X- → CS2 + ROH + A1TA+X- (R stands for the alkyl chain of the xanthate). Therefore, addition of H+X- to A1TA+ (xanthate)- will give a quaternary ammonium salt containing X- as a counterion.

Cetyltrimethylammonium ethyl xanthate was used in this work and cetyltrimethylammonium chloride, bromide, and nitrate were obtained by adding HCl, HBr, or HNO3 to the cetyltrimethylammonium ethyl xanthate. Analysis of Cl-, Br- CTA+ content and critical micelle concentrations of the prepared compounds gave results in excellent agreement with the theoretical values.