

Synthesis and ionophoric properties of α,ω -diphosphorylated aza podands: II. Kabachnik-fields reaction as a method for design of α,ω -diphosphorylated aza podands and their use for determination of metal ions

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Abstract

Methods of the design of podands with α -aminomethylphosphine oxide terminal groups with the purpose of investigation of the ionophoric properties of the podands and their use as components of ion-selective electrodes are analyzed. The most convenient procedure is a one-pot synthesis based on the Kabachnik-Fields reaction in a system comprising a dialkyl(aryl)phosphinous acid, formaldehyde, and a diamine. An alternative procedure is two-stage and involves the reaction of a primary amine with a phosphinous acid and formaldehyde to form an α -aminomethyldialkyl(aryl)phosphine oxide in the first stage and cross-linking of two molecules of this compound via reaction with a dihalooligoether of the corresponding length in the second. Advantages and disadvantages of both procedures are considered. Electrode-active properties of the prepared aza podands are studied to show that ion-selective electrodes on their basis can be used for selective determination of low concentrations of alkali and alkaline-earth metal ions. ©2005 Pleiades Publishing, Inc.

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