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Potentiometric Determination of the Stability Constants of Lanthanide Complexes with Iminodiacetic Acid in Water and Dioxane-Water Mixtures

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Abstract: The protonation constants of iminodiacetic acid (H_2 ida) and the stability constants of its complexes with Nd(III), Sm(III), Gd(III), Dy(III), and Er(III) ions at metal/ligand mole ratios of 1:1, 1:2, and 1:3 at 25 °C and 0.1 M ionic strength in aqueous medium and 20%, 45%, and 70% w/w dioxane-water mixtures were determined by the potentiometric method using the BEST computer program. The stability constants of the complexes that formed increased as the dioxane content increased. The stability of all the analogues' complexes, both in aqueous medium and in dioxane-water mixtures, were in the order of Nd(III) < Sm(III) < Gd(III) < Dy(III) < Er(III).

Key Words: Iminodiacetic acid, lanthanide(III) complexes, stability constants, dioxane-water mixtures.

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