

Investigation of the optical and ultrasonic properties of praseodymium and cerium chlorides in nonaqueous solutions.

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Streszczenie

The excitation, emission and absorption spectra of anhydrous and hydrated chlorides in anhydrous alcohols (C_2H_5OH and $n-C_3H_7OH$) were investigated at 300 and 77 K with the aim of explaining the spectroscopic properties (emission and absorption) of Ce^{3+} and Pr^{3+} in non-aqueous systems. Ultrasonic velocities and densities were measured and adiabatic compressibility coefficients were calculated to explain the structure of the solvates forming in solution. The role of the type of solvent on the symmetry and stoichiometry of the solvates is discussed on the basis of intensity analysis and energy and splitting of f-d and f-f transitions and correlated with our previous ultrasonic and optical results. The effect of concentration and energy excitation on the structure and splitting of the bands observed in the excitation and emission spectra was examined. The results are interpreted in terms of chemical relaxation in solution and coordination of chloride anions.

Słowa kluczowe

Solvation, Praseodymium chloride, Cerium chloride, Ethanol, n-Propanol, Non-aqueous solutions, Spectroscopy, Sound velocity, Compressibility, Solvation numbers

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