

Internal Cation Mobilities in Molten (K, Dy_{1/3})Cl

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Internal cation mobility ratios in the molten system KCl-DyCl₃ have been measured at 1093 K by Klemm's countercurrent electromigration method. From these, and data available on the conductivities and molar volumes of the mixtures, the internal mobilities b of both cations have been calculated. With increasing concentration of Dy, b_K decreases. The decrease of b_K is attributed to the tranquilization effect by Dy³⁺ ions which strongly interact with Cl⁻ ions. With increasing concentration of K⁺, b_{Dy} decreases; this may be attributed to the stronger association of Dy³⁺ with Cl⁻ ions due to the enhanced charge asymmetry of the two cations neighboring to the Cl⁻ ions. It could not be clarified whether a species such as [DyCl₆]³⁻ is also an electrically-conducting species in the K⁺ rich range.

Key words: Klemm Method, Internal Mobilities, Molten DyCl₃, Tranquilization Effect.

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