

Electronic Absorption Spectra of Praseodymium in Molten Chlorides

Toshiyuki Fujii^a, Akihiro Uehara^a, Takayuki Nagai^{a,b}, and Hajimu Yamana^a

^a Research Reactor Institute, Kyoto University 2-1010, Asashiro Nishi, Kumatori, Sennan, Osaka 590-0494, Japan

^b Japan Atomic Energy Agency, 4-33, Muramatsu, Tokai, Ibaraki 319-1194, Japan

Reprint requests to T. F.; E-mail: tosiyuki@HL.rri.kyoto-u.ac.jp

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Electronic absorption spectra of trivalent praseodymium in various alkali chloride melts were precisely measured. The oscillator strength of the hypersensitive transition, $^3F_2 \leftarrow ^3H_4$, showed a clear decrease with increasing temperature. This temperature dependence was the inverse of reported cases for other trivalent lanthanoides. The Judd-Ofelt parameter was analysed, and the calculated oscillator strength showed quite good agreement with the experimentally obtained oscillator strength. However, the Ω_2 parameter, which is sensitive to the ligand environment change, showed a clear decrease with increasing temperature and negative values at high temperature. We found that the $^3P_0 \leftarrow ^3H_4$ transition and its shoulder peak are quite sensitive to the coordination circumstance change of the $[\text{PrCl}_6]^{3-}$ complex in molten chlorides. These intensities could be correlated with the octahedral symmetry of $[\text{PrCl}_6]^{3-}$.

Key words: Molten Salt; Praseodymium; Electronic Absorption Spectrometry;
Judd-Ofelt Parameter Analysis.