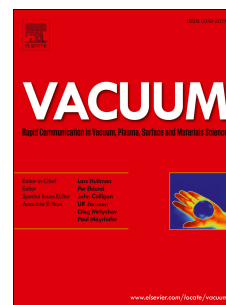


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Measurement of Coster-Kronig Vacancy Transfer Factor of some Lanthanides using monoenergetic X-ray photons

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ABSTRACT

Using monoenergetic X-ray photons from Indus-2 synchrotron Centre, the Coster-Kronig vacancy factor(κ) for L_3 subshell X-rays of some lanthanide elements such as Gd, Tb, Ho and compounds such as Pr_2O_3 , $\text{Pr}_2(\text{CO}_3)_3 \cdot 8\text{H}_2\text{O}$, Nd_2O_3 , Sm_2O_3 , $\text{Sm}_2(\text{CO}_3)_3 \cdot 2.85\text{H}_2\text{O}$, $\text{Sm}_2(\text{SO}_4)_3 \cdot 8\text{H}_2\text{O}$, $\text{Gd}_2(\text{CO}_3)_3$, Tb_2O_3 , $\text{Dy}_2(\text{SO}_4)_3$, Ho_2O_3 and HoF_3 have been determined experimentally. By measuring L_α X-ray production cross-section, the L_3 subshell fluorescence yield and theoretical values of the L_3 subshell photoionization cross-section and level widths, the κ values have been determined. Comparison of the measured experimental κ values with theoretical values indicates that the influence of the chemical environment on κ values in the selected lanthanide targets is not noticeable.

Keywords: L shell; Coster-Kronig; Synchrotron radiation; X-rays; vacancy transfer; lanthanides

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