

Experiment 08-01-926, BM08

Title: Eu site in silica and alumina thin films for photovoltaic applications

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Experimental conditions: XASat Eu L3-edge, fluorescence mode, room temperature. Due to sample dilution, a grazing incidence geometry was used. Monochromator: Si 311. Beam focused horizontally (monochromator) and vertically (mirrors).

Samples: Eu implanted amorphous substrates : silica (and alumina), some doped with Ag few-atoms clusters.

Results of preliminary analysis (FEFF code).

XANES: about 10% Eu(II) and 90% Eu(III).

EXAFS : Eu coordinates both O and Si. The site seems extremely disordered. The average Eu-O distance is 2.21 Å, while the Eu-Si one is about 2.69 Å. Work is in progress to correlate the Eu site with the optical properties.

In the figure, an example of data analysis.

Left panel: FT moduli (red: data, blue: fit) and imaginary parts (green: data, pink: fit). Right panel: spectra in k-space (red: data, green: fit).

