

**XPS study of Eu(III) coordination compounds:  
Core levels binding energies in solid mixed-oxo-compounds  $\text{Eu}_m\text{X}_x\text{O}_y$**

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Literature is relatively sparse on XPS studies of europium compounds: it is essentially restricted to metallic compounds ( $\text{EuM}_5$ , in which M is a transition metal) or to simple oxides. While particular interest have been devoted to understanding physical phenomenon in the beginning of "shake-down" and "shake-up" satellites evidenced on core-level regions of the lanthanides, few information on absolute binding energies (BE) was available. This paper reports an XPS binding energy data base for europium(III) compounds, in which Eu cation have various chemical environments: simple oxide  $\text{Eu}_2\text{O}_3$ , Eu mixed oxides with organic oxalate, acetylacetonate or inorganic sulfate, nitrate, carbonate ligands. The values of core-level BE ( $\text{O}_{1s}$ ,  $\text{Eu}_{3d}$  and  $\text{Eu}_{4d}$ ) and the characteristics of shake-down satellites of  $\text{Eu}_{3d}$  are reported, and their variations are attributed to ionicity/covalency changes. Such interpretation was already published for Group A mixed oxides and zeolites. These data are needed for determining Eu(III) species sorbed onto minerals in the presence of various ligands in the framework of retention studies for assessing the safety of future nuclear waste disposals.