

Influence of electrodeposition conditions on the properties
of samaria films

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Rare earth metals oxides are an interesting class of materials due to potential applications as catalysts, in fuel cells and so on. Such oxides films can be straightforwardly fabricated by electrodeposition from simple solutions.

We tested the influence of deposition conditions on the properties of samaria films. Systematic experiments were carried out from baths containing different amounts of samarium ions using different overvoltages. We found that the processes lead to the formation of nanostructured, nanoporous films of samaria with a morphology depending on the growth rate. EDX and XPS measurements were carried out for determining the films compositions and the relation with the preparation parameters.

Thermal annealing experiments were carried out on different samples, the samples being characterized again afterwards. We found that the traces of chloride present after the growth are removed by annealing and the crystalline quality is increased.

We found that practically the electrodeposition can be employed as a reasonable way of producing samaria nanostructured films in a cheap and scalable manner.