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Abstract

By the virtue of versatility in composition, morphology, and structure, two-dimensional (2D) layered nanomaterials have attracted in the last decade huge interest. Such materials, consisting in stacked charged nanosheets intercalated with opposite charged exchangeable anions, are of great potential for the design and fabrication of nanomaterials in many applications. Indeed, the interlayer gallery provides a flexible space to accommodate various sized molecules (*e.g.* pollutants) and tune specific active sites at the atomic space (*e.g.* catalyst materials). The interest for 2D layered nanomaterials is also associated with the possibility of obtaining via exfoliation ultra-thin nanosheets with lateral dimensions of hundreds of nanometres and thickness of few nanometres. This unique class of nanomaterials has shown many unprecedented properties mainly originating from the dimensional anisotropy and nano-confinement effects.

Herein we propose novel 2D layered ceria based oxides (*e.g.* CGO) synthesized via the heterogeneous precipitation. CGO materials were selected because of their strategic relevance in many technological applications (*e. g.* catalysis and electrochemical devices). The synthesized CGO layered materials were characterized for their composition, morphology and crystallographic features. The combined experimental results indicated that the layered CGO, with tunable dopant concentration, can be obtained in different morphologies by controlling the synthesis parameters.