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**Effect of iron doping nano-GDC synthesized via low temperature heterogeneous precipitation**

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Gadolinium-doped cerium oxide exhibits beneficial properties for application as an electrolyte in electrochemical devices. However, it requires a high sintering temperature to obtain a fully dense body. In this study the effect of adding iron oxide to gadolinium-doped cerium (GDC) oxide to improve its sinterability and electrochemical performance was accessed. Doped GDC with different Fe molar concentrations (1, 3, 5 mol%) was successfully synthesized by a one-step aqueous precipitation method. Adding Fe<sub>2</sub>O<sub>3</sub> as a sintering aid increases the GDC densification and reduces its usual sintering temperature by ~300 °C. The microstructural and electrical properties of sintered pellets evidenced that using iron oxide as a sintering aid is a promising strategy to decrease sintering temperature of GDC.