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Characterization of $Ce_{1-x}Pr_xO_2$ was Synthesized by a Co-precipitate Method.

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$Ce_{1-x}Pr_xO_2$ (x = 0, 5, 10, 15 and 20) was synthesized by a co-precipitate method. The crystallization temperature started around 300 °C. After calcination at 800 °C for 8 hr, the grains size of undoped sample was about 69 nm. Doping Pr into CeO_2 resulted-in the reduction to grains size. The smallest grains size of 40 nm was observed for $Ce_{0.8}Pr_{0.2}O_2$. Incorporation of Pr into ceria lattice was confirmed from the increased in lattice parameter and oxygen vacancy. Moreover the area intensity ratio of ceria main peak over the vacancy peak was reduced with the increasing dopant. $Ce_{0.8}Pr_{0.2}O_2$ have the highest conductivity of 0.01 S/cm above 600 °C.

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