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LATTICE PARAMETERS IN YTTRIA-DOPED CERIA SOLID ELECTROLYTES

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Ceria-rare earth solid solutions are known as solid electrolytes with potential applications in oxygen sensors and solid oxide fuel cells. Trivalent rare earth ions enter into solid solution introducing a number of anion vacancies for charge compensation. These oxygen vacancies are quite mobile at low temperatures giving rise to a comparatively high ionic conduction. In this study ceria-x mol% yttria solid solutions were prepared with x ranging from 0 to 12 by solid state reactions. These solid solutions exhibit a fluorite-type structure with composition dependent lattice parameters. The variation of the lattice parameter was studied and correlated with existing empirical equations based on ion packing model. The effect of an effective ionic radius of  $Y^{3+}$  in eightfold coordination is also discussed.

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