Short Communication

Study of the Electrical Conductivity of Al(III) Doped $\text{Sr}_{0.6}\text{Na}_{0.4}\text{SiO}_{3-\alpha}$

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$\text{Sr}_{1-x}\text{Na}_x\text{SiO}_{3-0.5x}$ is receiving worldwide attention as the fast oxide ion conductor. $\text{Sr}_{0.6}\text{Na}_{0.4}\text{Si}_{0.9}\text{Al}_{0.1}\text{O}_{3-\alpha}$ and $\text{Sr}_{0.6}\text{Na}_{0.4}\text{SiO}_{3-\alpha}$ were successfully fabricated using a solid state synthesis method and characterized with X-ray diffractometer (XRD) and scanning electron microscopy (SEM). From the results of XRD and SEM, it was demonstrated that both samples consist of crystalline SrSiO_3 and amorphous $\text{Na}_2\text{Si}_2\text{O}_5$. The Al^{3+} ion doping in the $\text{Sr}_{1-x}\text{Na}_x\text{SiO}_{3-\alpha}$ system led to the decrement of the amorphous Na-rich phase, and extended the scope of the oxide ionic conduction, though it resulted in a negative effect on the conductivity.

Keywords: Strontium silicate; Electrolyte; Fuel cell; Conductivity

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