ELECTRICAL CONDUCTIVITY OF Na_2SO_4 DOPED WITH SMALL AMOUNTS OF YTTRIUM

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Electrical conductivity of polycrystalline pellets made from solution grown crystals of undoped and 0.1-0.5 mol% yttrium doped Na_2SO_4 has been measured using complex impedance method. All the doped samples show increase in conductivity over the entire temperature range studied from 150 to 500°C, 0.1 mol% yttrium increases the conductivity of Na_2SO_4(I) by about 50 times whereas the 0.5 mol% doping produces as increase of about 125 times. The activation energies in the temperature range considered ranges from 0.63 eV undoped Na_2SO_4 to 0.45 eV for 0.5 mol% doped sample. The observed conductivity enhancement can be associated with the increased vacancy concentration caused by Y^{+3} substitution.

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