

An Investigation of New Phase Diagram of Ag₂SO₄-CaSO₄

Authors : Ravi V. Joat, Pravin S. Bodke, Shradha S. Binani, S. S. Wasnik

Abstract : A phase diagram of the Ag₂SO₄ - CaSO₄ (Silver sulphate - Calcium Sulphate) binaries system using conductivity, XRD (X-Ray Diffraction Technique) and DTA (Differential Thermal Analysis) data is constructed. The eutectic reaction (liquid → a-Ag₂SO₄ + CaSO₄) is observed at 10 mole% CaSO₄ and 645°C. Room temperature solid solubility limit up to 5.27 mole % of Ca²⁺ in Ag₂SO₄ is set using X-ray powder diffraction and scanning electron microscopy results. All compositions beyond this limit are two-phase mixtures below and above the transition temperature (≈ 416°C). The bulk conductivity, obtained following complex impedance spectroscopy, is found decreasing with increase in CaSO₄ content. Amongst other binary compositions, the 80AgSO₄-20CaSO₄ gave improved sinterability/packing density.

Keywords : phase diagram, Ag₂SO₄-CaSO₄ binaries system, conductivity, XRD, DTA

Conference Title : ICAPM 2014 : International Conference on Applied Physics and Mathematics

Conference Location : Singapore, Singapore

Conference Dates : September 11-12, 2014