Growth and Characterization of Undoped, Sr2+-, and Mn2+-doped Ammonium tetrachlorozincate

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Abstract:

Crystals of ammonium tetrachlorozincate (AZC) undoped and doped with Sr2+ or Mn2+ in different concentrations were grown by the slow evaporation method from an aqueous solution. The crystal morphology changed considerably by doping. The dopant concentration in the crystals was measured by the atomic absorption technique. Slight changes in the unit cell parameters of AZC after doping with Sr2+ or Mn2+ have been detected. Optical absorption measurements indicated strong influence of Sr2+ and Mn2+ doping. The optical energy gap at room temperature decreased continuously with increasing Sr2+ and Mn2+ concentration but with two different rates. The dc conductivity was also measured as a function of temperature for the undoped and two samples doped with 0.144 Sr2+ and 0.191 Mn2+ and the results were compared. Positions possibly occupied by Sr2+ and Mn2+ cations in AZC lattice have been identified

Keywords:

ammonium tetrachlorozincate, crystal growing, effect of doping

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