

Oxygen vacancy clustering and short-range pyrochlore ordering in yttrium niobate

Acceptor doped yttrium niobate ($Y_3Nb_{1-x}Ti_xO_{7-\delta}$) is an oxygen ion conductor in a wide range of oxygen partial pressures. This material crystallizes in so-called defect fluorite structure, which possess intrinsic oxygen vacancies. These vacancies are essential to achieve protonic conductivity. Many factors may promote and hinder the total conductivity of this material, which is crucial to the further applicability. Hence in this work structural and electrical properties are shown, focusing on the influence of titanium doping up to 15 mol%. The results show non-monotonic changes in the properties with increasing titanium content, what may be assigned to a short-range pyrochlore ordering and/or oxygen vacancy clustering within the structure.

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