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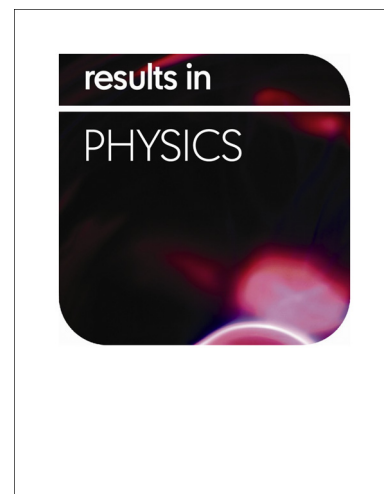
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Investigation of the percentage and the compacting pressure effect**On the structural, optical and thermal properties of alumina-zeolite mixture.**

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Abstract

This paper presents a detailed investigation of the correlation between micro-structural, optical and thermal properties of a mixture constituted of NaA zeolite and Al₂O₃ alumina with different portions at various compacting pressures. A comprehensive study was made by using SEM, EDX, XRD, PL and PTD analysis. Through this full characterization, it was demonstrated that a mixture of grain size ranging from 50 nm to 85 nm can be used as a red emitter of mean wave length $\lambda = 650 \mu\text{m}$ in optical devices. This mixture also proved to be used as a thermoinsulator or a thermocondensor material; with a thermal conductivity of about 0.22-1.33 W.m⁻¹.K⁻¹ and a thermal diffusivity of about 0.070-0.174 cm².s⁻¹.

Keywords: NaA Zeolite, Alumina, Photoluminescence, Thermal properties

Introduction

Zeolites are microporous, alumino silicate minerals, consisting of three-dimensional arrangement of SiO₄ and Al₂O₃, linked by oxygen atoms that form different construction units and large frameworks. Having specific nanochannels, nanopores and ion-exchange capacity, zeolites can be used in various applications as molecular sieves, adsorbents, catalysts [1]. The synthesis of zeolites, has received significant attention in recent years. This is because they have a wide variety of starting materials containing high amounts of Si and Al, e.g., kaolin, high-silica bauxite, halloy site, interstratified illitesmectite, montmorillonite...etc. [2-9]. Zeolites were confined almost 200 years ago in mineralogical museums because of their beauty. The ability to synthesize with a controlled structure and size also proved to be useful in various applications ranging from the separation gas

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