

Cadmium oxyorthosilicate synthesis by a Sol-Gel method

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Highlights

Cadmium oxyorthosilicate, Cd_3SiO_5 synthesis was viable using a sol-gel route

Resumo/Abstract

Cadmium silicates are a group of materials of great interest due to its stability and the possibility of tailoring phosphors.¹ While cadmium metasilicate (CdSiO_3) is well described in the literature and orthosilicate (Cd_2SiO_4) is being explored in some studies, the same does not happen with oxyorthosilicate due to difficulties in obtaining it pure.² A sol-gel route, using Cadmium Acetate and Tetraethylorthosilicate (TEOS) as precursors in a stoichiometric proportion of 2:1, obtained cadmium oxyorthosilicate. The solution was subjected to constant stirring for 2 h at 80 °C. The Gels dried and underwent calcination at 800°C for 4h. Different pH conditions were applied.

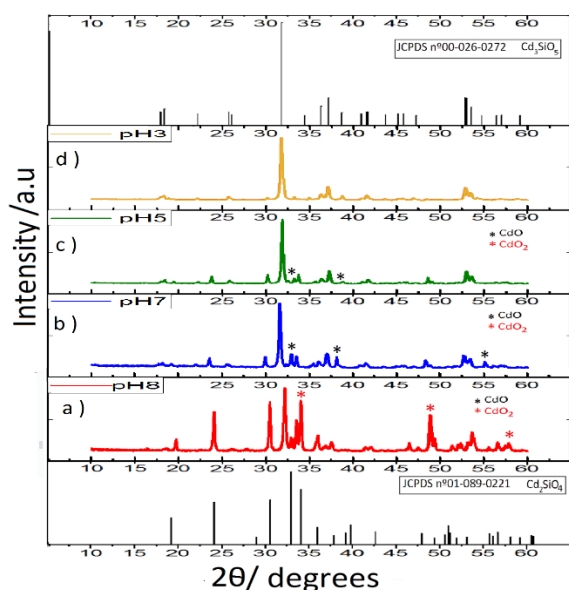


Figure 1. DRX of samples obtained by sol-gel

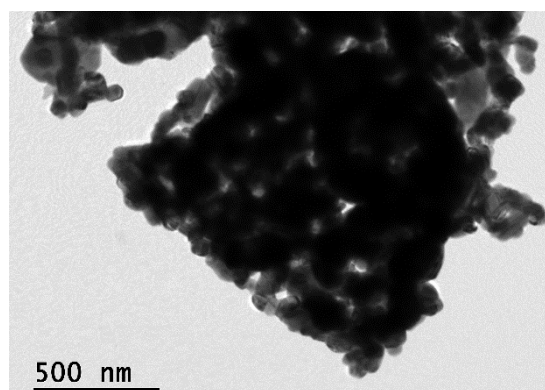


Figure 2. TEM image of Cd_3SiO_5 sample

The use of pH 3 and calcination at 800°C resulted in the Cadmium Oxyorthosilicate compound Cd_3SiO_5 , identified by x-ray diffraction (XRD). The use of pH 8, on the other hand, increases the formation of the Cd_2SiO_4 phase. Transmission electronic microscopy (TEM) images shows the formation of aggregates.

Reference

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