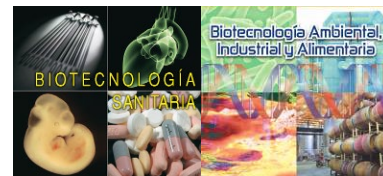


Poster

ZIF-8 MOF used as optic sensor for toxic gases

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Keywords: metal-organic frameworks; MOFs; ZIF-8; optical sensor; doping; hydrogen sulfide gas;**ABSTRACT**

Metal-Organic frameworks (MOFs) are crystalline organic-inorganic porous materials comprised of metal atoms or clusters coordinated by organic ligands. ZIF-8 (zeolitic imidazole framework), due to the absence of an intrinsic fluorescence, has never been used as optical sensor. In this work, ZIF-8 has been doped with Cd (II) atoms (2.5%), showing a huge enhancement of the fluorescence compared with the non-doped ZIF-8. This new material is suitable for optical sensing, being sensitive to hydrogen sulfide gas, which causes quenching of the luminescence proportionally to its concentration.

Methods: ZIF-8 was synthesized at room temperature mixing a methanol solution of $Zn(NO_3)_2 \cdot 6H_2O$ with a methanol solution of 2-methylimidazole (Hmim), with Zn (II), Hmim, methanol ratio of 1:8:700 [1].

ZIF-8 was doped with Cadmium by four different methods; the doped samples were named ZIF-8-A1, ZIF-8-B, ZIF-8-A2 and ZIF-8-B2. The methodology followed was described by H. Fei et al. in [2], with some modifications. The difference among the varieties was the solvent and the post-treatment after mixing the compounds.

The doping method was accomplished by dissolving 0.4 mmol of $Cd(NO_3)_2$ and 20mg of ZIF-8 in DMF (3mL) (for ZIF-8-B and ZIF-8-B2) or methanol (3mL) (for ZIF-8-A2). ZIF-8-B was obtained by gently heating at 60°C for 48h; ZIF-8-A2 was obtained by stirring for 48h at room temperature; ZIF-8-B2 was obtained by stirring for 48h at room temperature.

For sensing measurements, the samples were exposed to saturated gases of H_2S and the fluorescence change was monitored.

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