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Polymorphism, the ability of a molecule to crystallize in more than one packing arrangement, is a popular chemical and crystallographic phenomenon [1]. Polymorphs can be generally recognized by virtue of their different unit cell parameters and often from the different crystal symmetries. The occurrence of polymorphs implies that the free energies of the various crystalline forms are comparable. The crystallization process to lead a polymorph is generally sensitive to variation in the conditions such as temperature, type of solvent, pressure and the manner in which the crystals are obtained. Polymorphism results when different (but energetically similar) packing interactions are operative during crystal growth. Here, we present two X-ray crystal structures of $\text{HgBr}_2 \cdot \text{dppf}$ adduct, briefly, which exhibit conformational polymorphism. The dimorph (1) and (2) are supramolecular adducts bearing ferrocene moiety and two bromide ligand. Crystallization of the complex in THF led to orange crystals whereas recrystallization of the compound in DMSO resulted a mixture of orange (1) and red crystals (2). Polymorphs may be identified from differences in the relative orientation of phenyl rings of diphenylphosphine groups of flexible dppf ligand. This unique phenomenon is not known for the other coordination complexes of mercury(II) halides (chloride and iodide) with dppf as ligand [2-3]. Single crystal X-ray diffraction study of the polymorph (1) shows a monoclinic ($C2/c$) system. Red crystals of the polymorph (2) crystallizes in triclinic ($P\bar{1}$) system.

The independent molecules observed in the dimorphs differ in their angle between the P-C-Fe mean planes of coordinated dppf ligand. The conformational differences between the two polymorphic modifications are depicted in Figure 1.

The conformation of each dppf ligand with respect to the central iron may be defined according to the PC-Fe-PC angle. Conformational changes from one structure to the other lead to formation of two different polymorphs. In order to establish whether conformational changes were reason for the polymorphism.

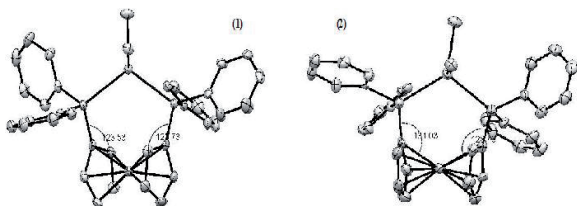


Figure 1. The P-C-Fe bond angle in dimorph (1) (left) and (2) (right).

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Deposit of ZnO films by SS-CVD to atmospheric pressure,

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ZnO films were deposited by single source chemical vapour deposition (SS-CVD) technique. The zinc acetate dihydrate was used as a precursor of Zn and oxygen as oxidant agent. ZnO thin films

were grown on glass substrates at different deposition temperatures (250–400 °C in steps of 50 °C) at atmospheric pressure. The structural properties were investigated by X-ray diffraction (XRD) and atomic force microscopy (AFM). Low temperature deposition is provide by SS-CVD system, this characteristic generate high deposition rate which facilitate the ZnO films formation. X-ray diffraction indicates that all deposited films were polycrystalline. The films deposited shown a preferred orientation depending of the substrate temperature. This feature determines the shape of the structure of the ZnO films. The lattice parameter strain decrease in the ZnO films by the increase of the deposit temperatures. The texture coefficient for (002) plane is 2.25. Our samples showed a transmittance in the range of 75 % to 90% in the visible region.

Keywords: CVD, zinc oxide, X-ray

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Structural characterization of a new series of (Gd,R)-cuprate. R=Rare Earth

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Great advances have been made in achieving superconductivity at high temperatures. Superconductivity up to 120 K has been found in $\text{Ti}_2\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10}$, with tetragonal structure with $a=3.85 \text{ \AA}$, $c=35.9 \text{ \AA}$ and S.G. I4/mmm [1, 2]. On the other hand, rare earth systems have had a considerable attention because they could give interesting electric and magnetic properties [3].

In this work, we present preliminary results in making ionic substitutions on $\text{R}_2\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10} \cdot \text{Li}$ (R = Gd, Dy, Ho) mixing the appropriate stoichiometric amounts of reactants for perform a conventional solid state reaction. The synthesis was nearly followed by X-ray diffraction, in order to reach the best conditions for synthesis. To observe the thermal stability, a combination of Thermo-Gravimetric Analysis (TGA) and Differential Scanning Calorimetry (DSC) were carried out. The characterization was completed by the study of morphology by Scanning Electron Microscopy (SEM) and chemical analysis by Electron Dispersive X-Ray Spectroscopy (EDX).

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Synthesis and structural characterization on RESrMnO_3 (RE=Rare Earth) system

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