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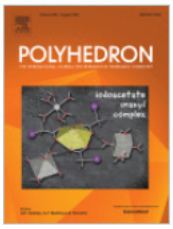

Laminated dihydrazone Zn(II) coordination polymer with prospects for sensory and multifunctional biomedical applications

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Abstract

This study introduces a new laminated coordination polymer, {[Zn3(HL)2(H2O)6](SO4)2·1.5dmf·2.5H2O}n (1), synthesized through the direct interaction of ZnSO4·7H2O with dihydrazone Schiff base ligand (H2L = 2,6-diacetylpyridine bis(isonicotinoylhydrazone)) at room temperature. Comprehensive characterization of the compound, employing various methods (SCXRD, PXRD, IR, TGA) revealed different coordination surrounding of metal atoms and a combination of photoluminescent properties and biological activity. The polymeric layers are corrugated along the b-axis, mutually intertwined forming channels filled with outer sphere anions (SO42-) and solvent molecules (water and dmf). It was shown that solvent molecules have a decisive influence on the photoluminescent properties of the compound. The partial removal of water molecules leads to increased photoluminescence, the intensity of which doubles compared to the synthesized crystals. Furthermore, the compound demonstrates robust antibacterial effects against four Gram+ positive and two Gram- negative bacteria. In addition, its impact on cell proliferation, both in cancerous and non-cancerous cells, reveals the compound's antiproliferative effect on breast cancer cells in vitro, coupled with biocompatibility with human fibroblasts. This multifaceted approach positions the

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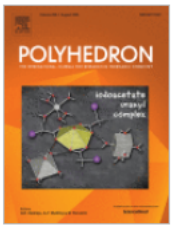

synthesized polymer as a promising candidate with vast potential for applications in luminescent materials and biomedical research.

Keywords: coordination polymers, photoluminescence, antibacterial effect, cytotoxicity, breast cancer cells, cell proliferation

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