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ABSTRACTS**

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## Polyurethane/ferrites composite materials: A study on antimicrobial activity

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Polyurethane (PU) nanocomposites are highly utilized in biomedical devices/implants due to their excellent mechanical properties, good biocompatibility, and low cytotoxicity. These PU nanocomposites with silver nanoparticles are well known potent antimicrobial agents. Biocompatible magnetic nanoparticles such as ferrites has also gained attention especially in various fields of drug delivery, biosensing and magnetic resonance imaging which requires highly specific magnetic nanoparticle (MNP) properties such as uniform size distribution, less agglomeration and stability in the biological medium. Among MNP, copper and zinc ferrites have been broadly applicable in biomedical, optoelectronic, catalysis and drug delivery. With a view to design PU/ferrites nanocomposites and to explore their antimicrobial potential, the present preliminary study reports the preparation of PU nanocomposites with copper ferrite and zinc ferrite (1 wt.%) and with the same composition. The nanocomposites were characterized using water absorption and swelling measurements. The antimicrobial activity of these composites was investigated against four bacterial strains: *Staphylococcus aureus*, *Enterococcus faecium*, *Pseudomonas aeruginosa*, and *Klebsiella pneumoniae*, and one *Candida* strain, *C. albicans* and compared with those of PU nanocomposites with silver ferrite nanoparticles. PU nanocomposites based on zinc and copper ferrites did not show antimicrobial activity, on the contrary they supported microbial attachment and growth. However, PU nanocomposites with silver ferrite did not show significant antibacterial activity but show antifungal activity and it is related with hydrophilicity of the prepared materials.

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