

A facile strategy for the preparation of composite Resin incorporating silver and magnetic nanoparticles with enhanced antibacterial properties

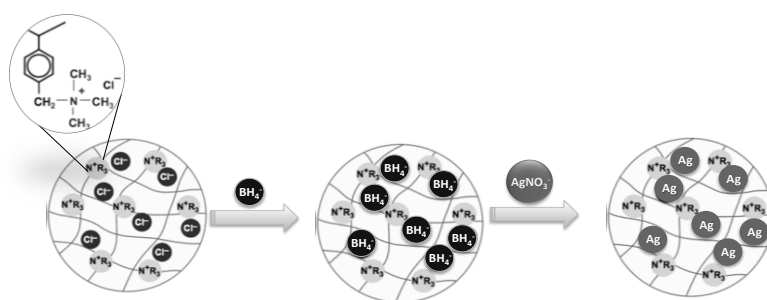
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Abstract (300 word limit)

A novel and facile route for the immobilization of silver and magnetic nanoparticles in anion exchange resin beads with different loading is proposed. Morphology and structure of the resulting resin nanocomposites were characterized by X-ray diffraction (XRD), scanning electron microscope (SEM), energy dispersive spectroscopy (EDS), fourier transform infra-red (FTIR), and thermogravimetry analysis (TGA). The results confirmed the presence of smaller diameter Ag NPs and Fe₃O₄ incorporated into the resin beads having an average diameter on the order of 10 nm with a few nanoclusters of 20-100 nm. The Ag-loaded resins were tested for antibacterial activity in vitro against Escherichia coli (E. coli) as a model microbial contaminant in water, and results showed excellent bacterial inhibition. The resin form offers greater ease of handling, long term storage at room temperature, reusability in repeated reactions, and reduces the risk of environmental contamination.

Please insert Image/Figure



Recent Publications (maximum 5)

1. Kasraei, S., Sami, L., Hendi, S., AliKhani, M. Y., Rezaei-Soufi, L., Khamverdi, Z. *Restor. Dent. & Endod.* 39 (2014) 109-114.
2. Liguori, F., Coiai, S., Passaglia, E., Barbaro, P. *Chinese Journal of Catalysis.* 36 (2015) 1157-1169.
3. Agnihotri, S., Mukherji, S., Mukherji, S. *Nanoscale.* 5(16) (2013) 7328-7340.

Biography (150 word limit)



Dr Mohammed Jaouad Meziani received his B.S. (1994) degree in chemistry from the University of Mohamed I in Morocco, and both his M.S. (1995) and Ph.D. (1999) degrees in physical and analytical chemistry from the University of Montpellier II in France under the supervision of Dr Stanislas Partyka and Dr Deborah Jones. He then worked as a senior research associate with Prof. Ya-Ping Sun in the Department of Chemistry at Clemson University in USA. He is currently an Associate Professor at the Northwest Missouri State University. His research is in the development of nanostructures and nanomaterials for optical, electronic, and biomedical applications. He published more than 90 papers in peer-reviewed journals.
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