J Nanomed Nanotechnol 2013, 4:6
http://dx.doi.org/10.4172/2157-7439.S1.015

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Nanotek & Expo

December 02-04, 2013 Hampton Inn Tropicana, Las Vegas, NV, USA

Iron oxide nanoparticles incorporated polyvinyldene fluoride (PVDF) microfiltration membranes for industrial wastewater treatment

Anum Imtiaz, Sher Jamal Khan, ErumAamir, Ishtiaq A. Qazi, Nadeem Iqbal and Nasir M. Ahmed
National University of Sciences and Technology (NUST), Pakistan

Iron oxide nanomaterial has a great potential for the degradation of halogenated organics, nitrates, sulfates and heavy metals. The present investigation reports the effect of iron oxide nanoparticles on the morphological, water flux, monovalent salts and heavy metal rejection properties of the polyvinyldiene fluoride (PVDF) microfiltration membranes. Iron oxide particles were synthesized using co-precipitation method. X-ray diffraction (XRD) analysis showed crystalline face-centered nanoparticles with average diameter of 30-35 nm observed under scanning electron microscopy (SEM). Induced concentrations of 1, 3, and 5% with the functionalized nanoparticles were impregnated in the membrane solution to fabricate polymer nanocomposite membranes. Thermally induced phase separation method was applied to generate micro porosity in the developed membranes and characterized for microstructure and morphology by SEM, EDX, XRD and FTIR analysis. The average pore size within the membrane reduced, and ultrapure water flux diminished with increasing functionalized nanoparticle concentration in the polymer solution and nano fillers into the matrix ratio, respectively. The rejection studies were investigated at different concentrations of heavy metals including Cd (II) and Cu (II) as well as pH using dead end filtration cell (Amicon, Model 8400 Millipore, USA). Atomic absorption spectroscopy results show high sorption of Cd (II) and Cu (II) by iron oxide nanomaterials impregnated PVDF membranes.

anum_imtiaz87@yahoo.com

Synthesis of biocapped nanoparticles and their antimicrobial efficacy: A new approach

Anamika Mubayi[1], Sanjukta Chatterji[1], Prashant Kumar Rai[2] and Geeta Watal[1]
[1]University of Allahabad, India
[2]All India Institute of Medical Sciences, India

Nanotechnology aims to generate considerable technological and scientific progress in diverging fields of physiology and pharmaceutics. Green synthesis of nanoparticles is a novel cost-effective, eco-friendly approach than the present physicochemical routes. Plant-derived green synthesis of silver nanoparticles is a rapid, safe, economical and reproducible route. The present study focuses on environmentally benign synthesis of silver nanoparticles, using leaves of a proven medicinal plant viz., *Murraya koenigii* and hence avoiding the use of hazardous chemical agents. The study revealed the bioreduction of silver nitrate by the aqueous leaf extract of *M. koenigii* resulted into the formation of silver nanoparticles. Silver ions bioreduction indicated by gradual colour change and resultant production of silver nanoparticles was examined using UV-visible spectroscopy at reported wavelength of around 430 nm. XRD analysis exhibited the crystalline nature of these newly synthesized silver nanoparticles. FTIR analysis was also employed to assess the surface binding capacity of these nanoparticles indicating their enhanced stability. Biocapping of these silver nanoparticles by the phytoconstituents present in the extract did not allow them to aggregate. Moreover, these biosynthesized silver nanoparticles were subjected to antibacterial screening against different multi-drug resistant bacterial isolates viz., *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Klebsiella pneumoniae and Enterococcus faecalis* The antibacterial screening of silver nanoparticles demonstrated that these bio-capped nanoparicles possessed greater inhibitory action against most of the tested bacterial strains except *E. faecalis* than the plant extract of the leaves separately.

Biography

Anamika Mubayi has joined D.Phil. under the supervision of Dr. Watal in the Department of Chemistry, University of Allahabad, Allahabad, India. She has done her M.S. from the University of Iowa, USA and M.Sc. from CSJM University, Kanpur, India. She has worked as a senior research associate at IIT, Kanpur, India and research assistant at the University of Iowa, USA. She has several publications in national/international journals and has received poster award in James F. Jakobsen Graduate Conference, University of Iowa, USA. She has been to Lausanne, Switzerland for attending a nanotechnology-based training program.

anamikamubayi@yahoo.co.in