OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Nanotek & Expo

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

Biomanufactured nanoscale palladium catalyst: Effects of biomass type on catalyst activity in the reductive dechlorination of chlorobenzene

Jacob B. Omajali, Joe Wood and Lynne E. Macaskie
University of Birmingham, UK

Nanometallic catalysts have multiple industrial applications. Recent focus has been on their clean manufacture and biofabrication. Biofabricated nano-scale palladium (bio-Pd) is active in the reductive dehalogenation (hydrogenolysis) of chlorinated aromatic compounds. Bio-Pd catalyst is made via biosorption of Pd (II) and its subsequent reduction to Pd (0) to give bio-scaffolded Pd-nanoparticles on bacterial cell surfaces. Gram negative cells (e.g. *Desulfovibrio desulfuricans*) and gram positive cells (e.g. *Bacillus spp*.) made bio-Pd comparably active in hydrogenation reactions but have not been compared with respect to hydrogenolysis and dechlorination of chlorinated aromatic compounds. Bio-Pd (0) by *D. desulfuricans* and *Bacillus benzeovorans* were prepared and compared with respect to their patterning on bacteria. The Pd-nanoparticle sizes were measured via X-ray powder diffraction via data analysed using Scherrer's equation which indicated a significant difference in particle size. The bio-Pd catalysts were evaluated with respect to their differing abilities in the dehalogenation of chlorobenzene; both showed higher catalytic activity than commercial palladium on carbon (Pd/C) catalyst.

Biography

Jacob B. Omajali graduated in 2004 from Kogi State University, Nigeria where he studied Biochemistry. He got sponsored by *Petroleum Technology Development Funds*, PTDF, in 2008 for Master's in Industrial and Commercial Biotechnology at Newcastle University, UK. While at Newcastle, Jacob developed an interest in bio-catalysis and environmental remediation. Currently, he is a Ph.D. student at the University of Birmingham, UK under another scholarship.

JBO037@bham.ac.uk