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Polymer nanofibers for desulfurization of fuels

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This presentation will uncover progress in the fabrication and catalytic applications of various metal-based catalysts immobilized unto nanofibers. It will also highlight the challenges associated with the use of electrospun nanofibers in catalysis. Herein, we also explore the possible use of polymer-supported oxovanadium(IV)-based catalysts for the oxidation of organosulfur compounds in hydro treated fuel followed by adsorption of polar sulfone compounds using molecularly imprinted polymers in a form of nanofibers. The application of the oxidation and the adsorption steps to a mildly hydro-treated diesel sample has been demonstrated to reach less than 2 ppm S content.

Biography

Prof. Dr. Zenixole R. Tshentu is currently an associate professor of analytical/inorganic chemistry at the Nelson Mandela Metropolitan University (NMMU) in South Africa. He completed his PhD studies in Inorganic Chemistry at NMMU in 2005 and was offered a lectureship position at the Rhodes University Chemistry Department where he remained for 7 years until his move back to NMMU in 2013 as associate professor. He has published 64 articles in peer-reviewed national and international journals as well as three book chapters. He has experience in the solid state and solution studies of transition metals chemistry as well as using inorganic/organic polymer materials in separation technology and in heterogeneous catalysis. He has been involved in several projects such as designing organic extractants for the separation of base metals and platinum group metals via solvent extraction and ion exchange processes, designing ligands for the stabilization of therapeutic metals in biological systems, and designing catalysts for selective oxidation of sulfur compounds in fuels followed by selective adsorption of sulfones using molecularly imprinted polymers. The functional chemistry is typically hosted in microscale materials as well as nanomaterials such as nanofobers. He terms his philosophy “the quest for selectivity and specificity”.

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