

Adsorbent materials of next generation

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Sorption is a physical and chemical process by which one substance becomes attached to another. A specific case of sorption is the adsorption; Adsorption is the adhesion of atoms, ions or molecules from a gas, liquid or dissolved solid to a surface. This process creates a film of the adsorbate on the surface of the adsorbent. Adsorption is considered to be a very promising separation technique especially for the removal of pollutants in liquid-phase (dyes, heavy metals, phenols, etc). However, the economic crisis of the 2000s led researchers to turn their interest in adsorbent materials with some special characteristics: (i) super-adsorbent materials of high capacity; (ii) selective adsorbent materials (Molecular Imprinted Polymers – MIPs). The first class is contains many materials as activated carbons, agricultural wastes, modified polymers, graphenes, etc. The second class contains MIPs which are used for specific binding of highly-added value pollutants as precious metals (silver, gold) or drugs for recovery, etc. In this lecture, a recent summary of this type of works will be presented

analyzing in details the next-generation adsorbent materials, discussing many different (maybe in some occasions doubtful) topics such as: (i) adsorption capacity; (ii) kinetic modeling and (iii) desorption/reuse potential.

Speaker Biography

George Z Kyzas was born in Greece in 1980. He obtained his BSc, MSc and PhD degrees at Aristotle University of Thessaloniki (Greece). His current interests include the synthesis of various adsorbent materials for wastewaters treatment (dyes, heavy metals, pharmaceuticals, phenols, etc). He has published significant Scientific Papers (over 90 publications; H-index: 35; Imp. Factor, average: 4.1), Books (as Author and/or Editor), Chapters in Books, Teaching notes and Reports. He was also Guest Editor in Special issues of Journals and presented many works in International Conferences. He has been awarded with honors, grants and fellowships for his research career/profile by (i) Research Committee of Aristotle University of Thessaloniki (2009, 2013), (ii) National State Scholarships Foundation of Greece (2013), (iii) Stavros Niarchos Foundation (2016). Now, he is Associate Professor at the Department of Petroleum, Natural Gas Technology and Mechanical Engineering (Eastern Macedonia and Thrace Institute of Technology, Kavala, Greece).

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