



Mayyada El-Sayed

American University of Cairo, Egypt

Sorption and chromatography processes in environmental and biochemical applications

Sorption and chromatography processes have been widely used in a plethora of applications covering various aspects of our daily life. We highlight some of these applications through presenting some relevant work that has been undertaken by our group in three major areas, namely water treatment, bioseparation and biomedical engineering. For water treatment purposes, the removal of heavy metals, hardness ions and dyes using low-cost adsorbents, biosorbents and chelating agents is presented. Furthermore, the application of sorption and chromatographic processes in bioseparations is demonstrated by means of practical examples on the recovery of valuable proteins from whey mixtures, as well as separation of bioactive polysaccharides from algal extracts. Finally, the role of sorption equilibrium and kinetic studies in evaluating the activity and efficiency of biomaterials and

biosensors is addressed. Examples are provided on assessing the activity of biomaterials for bone regeneration via studying sorption kinetics of Ca and P ions onto their surface, as well as evaluating the efficiency of glucose-binding proteins as biosensors for diabetes through investigating the binding of glucose onto these proteins via sorption mechanisms.

Speaker Biography

Mayyada El-Sayed obtained her PhD in Chemical Engineering and Biotechnology at Cambridge University, UK. She worked as a visiting research faculty member at the University of Maryland Baltimore County (UMBC). She is currently an Associate Professor and Graduate Program Director at the Chemistry Department, American University in Cairo. She has been awarded the Fulbright Scholar Fellowship along with other professional awards. She is also a member of a number of professional associations including ACS, AIChE and IChemE.

e: mayyada@aucegypt.edu



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