

Keynote: Nano-technology and Nano-engineering for Chemical Engineers

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ABSTRACT

Nanotechnology/Nano-engineering for Chemical Engineers is a transformational educational lecture addressing basic principles of nanotechnology and translating them into nano-engineering with a particular focus on chemical engineering. This lecture aims to provide vital information about differences between descriptive technology and quantitative engineering for students as well as Professors and working professionals in various fields of technology/engineering. Besides chemical engineering principles, the fundamentals of nanotechnology are also covered along with detailed explanation of several specific Nano-scale processes from chemical engineering point of view. This information presented as practical examples and case studies that help the students, and researchers to integrate the processes which can meet the commercial production. It is worth mentioning here that the main challenge in production of nanostructure and Nano-devices are nowadays including from economic point of view to basic principles. The uniqueness of this lecture is a balance, between important insight into the synthetic methods of nanostructures and their integral relations with chemical engineering. Necessary rules that educate the audiences/ readers about process design, simulation, modeling, and

optimization are described. Briefly, the lecture takes the audiences/readers through a journey from fundamental fundamentals to frontiers of engineering of processes involved in production of nanostructures and those products comprising one or more nanostructures and informs them about industrial perspective research challenges, opportunities, and synergism in chemical engineering and nanotechnology. Utilizing this information, the audiences/readers can make informed decisions on their career and business. The above brief information makes chemical engineering among the most important engineering disciplines in the productive subsystem of nanoparticles. One important application of that is the production of Carbon Nano Tubes (CNTs) in Fluidized Bed Catalytic Reactors (FBCRs). CNTs are very important nanoparticles for the production of alloys and composites of very high strength and low density and have many applications. CNTs have many other applications and it is necessary to produce it in large quantities efficiently.

References

- [1] Said Salaheldeen Elnashaie, Firoozeh Danafar and Hassan Hashemipour Rafsanjani , Nanotechnology for Chemical Engineers, Springer Publisher, 2014