MECHANICAL ENGINEERING DEPARTMENT
ME/IE 8773-8774

MAIN DEPARTMENT SERIES
Topic: Nanotechnology
Host: Joachim V.R. Heberlein

Steps Towards Ecological Sustainable Nanoparticle Process Technology

by

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Wednesday, April 5, 2006
3:30-5:00 p.m.
Room 1130 ME
Coffee and refreshments will be available at 3:15 p.m. in Room 1130 ME before the seminar

ABSTRACT — New technologies have to be developed according to the rules of sustainability with respect to economy, sociology and ecology. The most interesting building blocks in nanotechnology are nanoparticles, because they provide the largest surface for interactions and they show the strongest size effects. It is foreseen that the production of nanoparticles will increase because of the development of new or improved products based on the special properties of nanostructured materials. From the ecological point of view new but also excisting process technologies for the production of nanoparticles have to be investigated with respect to their impact on the sustainability of nanotechnology. Sampling, conditioning and measurement techniques have to be developed for or at least adjusted to nanoparticles, which show very different properties compared with super-micron particles. We will report about steps towards the development of better tools for nanoparticle control in production, work places and the environment. We also will characterize different nano-particle process technologies with respect to their possible impact on the sustainability of nanotechnology. Based on these findings we will come up with recommendations for safer production and handling of nanoparticles.

BIO — Dr. Heinz Fissan is Professor in the Electrical Engineering Department, University Duisburg-Essen, Germany, and consultant at the **Institute of Energy and Environmental Technology e.V. (IUTA).** His research is in the field of aerosols and their application in different fields of technology, such as aerosol measurement technology, gas filtration, atmospheric aerosols, clean room technology and nanostructured materials. The last field includes the synthesis of nanostructures, the in situ and off-line analysis of nano-particles and –structures, the simulation of structure development and the application of nano-particles and structures in gas sensors and electronic and opto-electronic devices. He has approximately 300 publications on these subjects. He is a fellow of the International Aerosol Research Assembly since 1990 and received together with Professor D. Pui the Max Planck Research Award in 1993. In 1998 the American Association for Aerosol Research (AAAR) awarded him the David Sinclair Award. In the year 2000 he became Honorable Member of the Gesellschaft für Aerosolforschung (GAeF), Germany. The German VDI awarded him the gold medal for his achievements in standardization of process technology especially for nanoparticles including possible environmental impacts. The European Aerosol Assembly (EAA) decided to present to him the Junge-Award (2004), recognizing his contribution to establish nanoparticle technology as a new discipline in aerosol science.

Informal Faculty Luncheon: Wednesday, April 5, 2006, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Prof. Fissan will be able to attend.