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Measuring devices in nanotribology: A review

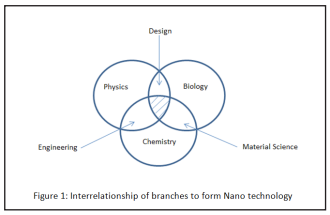

Figure 1: Interrelationship of branches to form Nano technology

Tribology is derived from a Greek word which means to rub. It plays a vital role in various technical fields and optimizes polishing process. It improves and increases the lifespan of machines and other mechanical components. It also reduces the loss of power. Nanotribology is defined as the investigations of interfacial processes, on scales ranging in the molecular and atomic scale, occurring during adhesion, friction, scratching, wear, nanoindentation and thin-film lubrication at sliding surfaces. Nanotribological studies are thus needed to investigate the tribological phenomenon at a nanoscale as well as to look for nanotribological solutions. Another major development, which has become possible via nanotribology is the design of new smart materials and their fabrication. It is the branch of tribology that studies friction, wear, adhesion and lubrication phenomena at the nanoscale, where atomic interactions and quantum effects are not negligible. This paper mainly focuses on the concept of nanotechnology along with its history and various instruments like surface force apparatus, scanning probe microscope, atomic force microscope, scanning tunneling microscope and near field optical microscopy. Also it studies the measurement techniques, detecting the three dimensional indents and effect of all the methods with their applications.

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Biography

Chithirai Pon Selvan obtained his Bachelors in Production Engineering, Masters in Computer Aided Design and Ph.D. in Mechanical Engineering. Dr. Pon Selvan has over twenty years of experience in teaching, educational assessment, classroom management and student relations. He has been invited and honored as key note speaker, session chair, resource person and technical committee member in various conferences in UAE, India, Thailand, Malaysia, UK, Germany & Italy. His research interests are in the areas of machine design, optimization techniques and manufacturing practices, particularly non-traditional manufacturing methods. He has received several prestigious awards in UAE including "Dubai Award for Sustainable Transport (2017)" from Road Transport Authority (RTA), Dubai, "Distinguished Conservation Project Award (2018)" from Dubai Electricity and Water Authority (DEWA), Dubai, "Teaching Excellence Award (2013-2014)" from Manipal University Dubai and "Dr. Kalam's International Excellence Award for Education (2017)" from Dr. APJ Abdul Kalam Lovers Foundation, UAE.

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