Seminar

Institute for Plasma Research

Title : Hydrophobic Silica Nanofluid and its Applications

Speaker: Ms. Janki Shah (Postdoc Fellow)
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Date : 19th June 2020 (Friday)

Time : 02.30 PM

Venue : Online - Join the talk: https://meet.ipr.res.in/JankiShahPDFextensiontalk

Abstract :

The suspension of solid particles in liquids is widely known to contribute to industrial liquid systems, such as heat transfer fluids, lubricant fluids, and magnetic fluids. Among these technologies, as engineering materials consisting of hydrophobic nanometer-sized particles and base fluids have attracted interest because of their broad applications as hydrophobic nanofluids in heat transfer, cooling of microchips, drug delivery, water condensation, and enhanced oil recovery. The present study contains a synthesis of SiO_2 nanoparticles powder with polar and non-polar surfactants to compare hydrophobic contact angle. These particles are prepared by chemical methods with sodium silicate precursors which is cost-effective than other SiO_2 precursors like TEOS etc. The contact angle (CA) of prepared silica nanoparticles with and without surfactant is measured. It is concluded that polar surfactant coated particles are hydrophilic having CA below 90 º and with non-polar surfactant silica shows around 140º CA. These silica nanopowders are suspended in water which is water repellent and diluted in pump oil. The mixture of silica suspended pump oil and water makes two separate layers of oil and water which may use as oil/water separation phenomena. The different layered solution of oil and water is excellent stable, and if it's proven successfully then this technique will be simple and relatively inexpensive for oil/water separation.