

Magnetically Propelled Probe for Robotic Applications and Air-Liquid Interface Characterization

Prashant S. Deulgaonkar¹, Sergey Klimonsky² and V. N. Lad^{1*}

¹Department of Chemical Engineering, SardarVallabhbhai National Institute of Technology - Surat, Ichchhanath, Surat 395007, Gujarat, India.

²Faculty of Materials Science, Lomonosov Moscow State University, Moscow 119991, Russia.
Email: vnl@ched.svnit.ac.in, lad.vnl@gmail.com

Abstract

Biorobots and microbots have been recently gained much interest among the researchers due to their diversified applications. Here, we show the performance of the magnetic probe which can be effectively used to fabricate biorobots, microbots and macrobots. Here we use magnetic steering method to correlate interfacial behaviour of the liquids with the dynamics of magnetic probe. We propose a new method for characterization of air-liquid interface using the magnetic probe. The variation of magnetic probe velocity with respect to different interfaces has been found to be an important parameter to characterize interfaces. Magnetic nanoparticles coated on the probes have been found to improve the tuning of probe sensitivity.

Keywords: Insoluble monolayer; surface pressure; surface viscosity; surface potential