

Determination of Surfactant Critical Micelle Concentration Using Contact Angle Measurements: A Didactic Lab

Boshra Akkelah, Sara Mansour and Hamza Amro

School of Pharmacy

A simple and reliable didactic laboratory has been developed to explain fundamental concepts of hydrophilicity, hydrophobicity, wetting and spreading phenomena for undergraduate students. The described laboratory herein includes the preparation of surfactant solution at different concentrations and applying droplets of these solutions on hydrophobic surfaces followed by imaging of the formed droplets using cost-effective digital microscope that is connected to a laptop. Contact angle values of droplets were then measured using an open-source image analysis software, namely ImageJ[®]. Students constructed surfactant concentration-contact angle curve successfully to determine the surfactant critical micelle concentration (CMC) value. The feasibility of the described didactic laboratory and the achievement of the intended learning outcomes (ILOs) were evaluated through complementary assessment tools including lab reports, home works and students' feedback sheets. The described laboratory was found to be cost-effective, safe, reproducible and achieving ILOs.