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**Using Remobilizing Surfactants to Increase the Terminal Velocity of Rising Bubbles** ASHISH TANEJA, The Levich Institute, DEMETRIUS PAPANAGEORGIOU, New Jersey Institute of Technology, CHARLES MALDARELLI, The Levich Institute — The terminal velocity of rising bubbles decreases and the interface is immobilized even if a trace amount of surfactants is present in the bulk liquid. In this work, we identified physiochemical criteria of surfactant, which insures that the interface of the bubble does not become immobile in their presence. Surfactants, which satisfy these criteria, are termed remobilizing surfactants. Remobilizing surfactants should have a very high solubility and are characterized by a rapid rate of kinetic exchange. We will present experimental evidence, which verifies these criteria. We used nitrogen bubbles rising either in water or a 70:30 mixture of glycerol-water and medium chain alcohols as surfactants. With hexanol in glycerol-water mixture 30% remobilization was achieved. However, with butanol in water, negligible amount of remobilization was achieved. This is attributed to the fact that water being a low viscous liquid, rising bubbles have a high terminal velocity and thus a high rate of convection on the surface of these bubbles. This high rate of surface convection is not being counterbalanced by the kinetic exchange. Thus the concentration gradient of surfactant molecules at the interface does not get eliminated and the interface remains immobile.

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