

Abstract Submitted  
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**Vertical Mobilization of a Residual Oil Phase in a Bead Pack  
Due to Flow of Discrete Gas Bubbles** KONARK PAKKALA, KENT UDELL,

University of Utah — Mobilization of trapped oil ganglia is of interest in soil and groundwater clean-up and enhanced oil recovery applications. In this work, experiments with glass beads and various oil phase compositions were performed to determine the volumetric fraction of the non-aqueous phase liquid that may be mobilized with rising discrete gas bubbles. Experiments were performed using 6 mm and 2 mm beads. The oil phase liquids included dodecane, perchloroethene, and trichloroethene representing both spreading and non-spreading oil phases. It was found that bubbles were quite effective in mobilizing all three oils including those with densities greater than that of the suspending water. The effectiveness of the mobilization was greater in bead packs with larger beads than in packs comprised of small beads. Volumetric fractional flows of the oil phase were up to 10% of the bubble-droplet volumes, with volumetric fractions decreasing with decreasing oil phase saturations and bead size. The geometry of the oil ganglia/gas bubble combinatory body was also a function of the bead size with smaller beads producing larger, flatter gas bubbles, and the large beads producing bubbles and ganglia of similar size and geometries as the beads themselves.

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