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Particle deposition during evaporation of colloidal sessile drops JAMES D. FELSKE, State University of New York at Buffalo, HASSAN MASOUD, Georgia Institute of Technology — Deposition patterns of particles suspended in evaporating colloidal drops are determined by the flow fields within the drops. Using analytically determined velocities, particle motions are then tracked in a Lagrangian sense. It is found that the majority of particles intersect the free surface as it recedes. Such "capture" of particles by the free surface is found to be the major mechanism in establishing the deposition pattern. Patterns are calculated for wetting and non-wetting drops whose contact lines are either pinned or freely moving during evaporation. The distribution of evaporative flux which drives the flows is taken to be that engendered by gas-phase diffusion. The theoretical results are found to agree favorably with available experimental data.

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