

Drying of particle-laden sessile drops of Newtonian and polymeric liquids on solid substrates

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The drying of particle-laden sessile drops was investigated experimentally. Depending on the size of particles, the viscosity of fluid and the wettability of solid surface, the drying pattern varied and there was a competition of the inward movement due to the surface force between the particles trapped in the air-liquid interface and the outward movement due to the Deegan flow. In water, the typical 'coffee ring' of colloidal particles was not always observed and spherical particles larger than 10 μ m in diameter moved toward the center. In xanthan gum or polyethylene oxide solutions, either inward or outward motion was observed depending on the low shear viscosity.