

Controlling the Morphology of Drying Droplets

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Control of the morphology of deposits holds importance in industry as inkjet moves from being a printing technology to a flexible manufacturing system. The drying process can impact strongly on the aesthetics of the print, resulting in a range of textures and colour blends depending on the nature of the solvents and particulates involved. High speed imaging allows visualisation of the internal flows within droplets and shows the complex process of forming a deposit. Solvent mixtures can initiate Marangoni flows which re-distribute particles inside the droplet by cycling flows that develop at the droplet centre or contact line depending on the Marangoni flow direction. Control over such flows can lead to ring-like structures, steep domes, flat even deposits, or small spots with a diameter much smaller than the initial printed droplet size.