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Clustering of particles and pathogens within evaporating drops JAEBUM PARK, HO-YOUNG KIM, Seoul National University — The evaporation of sessile suspension drops leads to accumulation of the particles around the pinned contact line, which is widely termed the coffee ring effect. However, the evaporation behavior of a liquid drop containing a small number of particles with the size comparable to the host drop is unclear yet. Thus, here we investigate the motion and spatial distribution of large particles within a sessile drop. The spherical particles cluster only when their initial distance is below a critical value, which is a function of the diameter and wettability of particle as well as the surface tension and size of the host drop. We rationalize such a critical distance for self-assembly based on the balance of the capillary force and the frictional resistance to sliding and rolling of the particles on a solid substrate. We further discuss the physical significance of this drop-mediated Cheerios effect in connection with the fate of pathogens residing in drops as a result of sneezing and coughing.

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