COMPETITIVE EVAPORATION OF MULTIPLE DROPLETS

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An asymptotic model is derived for the competitive diffusion-limited evaporation of multiple thin sessile droplets under the assumption that the droplets are well separated. Comparisons are made with numerical solutions of the full governing equations in order to verify the accuracy of the model; in particular, the model is found to perform well even outside its anticipated range of applicability, up to and including the limit of touching droplets. The "shielding" effect" of other droplets is demonstrated, and the model is used to investigate the effect of this shielding on droplet evolutions and lifetimes, as well as on the coffee-ring effect.