SUPPORTING VIDEO FILES.

With the article there are four video files as support of the experimental results.

Video 1 (.AVI): Movie showing a water droplet with 6.5 μm of diameter and propelled at a speed of 1.7 μm/s by an AC field with amplitude, E = 0.7 V/μm and frequency, f = 10 Hz, Fig. 1(b) of the article.

Video 2 (.AVI): Movie showing the absorption of a microdroplet (ϕ = 7.3 μm), filled with 11 polystyrene particles (1.7 μm diameter), by a larger droplet (ϕ = 18 μm) with a Saturn ring defect (E = 0.7 V/μm, f = 10 Hz), Fig. 3(a) of the article.

Video 3 (.AVI): Movie showing two water microdroplets (ϕ = 2.7 μm and 3.7 μm) driven in opposite directions by an AC field (E = 0.70 V/μm, *f* = 10 Hz) and containing the separated reactants, potassium ferrocyanide [hexacyanoferrate (II)] (0.2 M) and ferric ions [Fe^{3+}] solution (0.3 M). The droplets approach and coalesce in a larger one (ϕ = 4.3 μm), forming Prussian blue as a precipitate. In this particular example, the field was momentarily switched off to facilitate the assembly of the droplets. The AC field was then used to drive the resulting droplet away from the reaction zone, Fig. 3(b) of the article.

Video 4 (.WMV): Movie showing several small microdroplets (ϕ ~ 1 μm) which are accumulated without coalescence around a larger one (ϕ ~ 7 μm) with a Saturn ring defect via application of an AC field with strength E = 0.65 V/μm and frequency *f* = 20 Hz. Later on they are dispersed by decreasing the frequency of the field to *f* = 3 Hz. To better visualize the small droplets, the video was recorded with crossed polarizers.