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Frequency dispersion of electrokinetically activated Janus particles ALICIA BOYMELGREEN, TOV BALLI, GILAD YOSSIFON, Technion - Israel Institute of Technology, TOUVIA MILOH, Tel Aviv University — We examine the influence of the applied frequency of the electric field on the induced-charge electroosmotic flow around a metallo-dielectric Janus particle. Previously, we have used three dimensional-two component micro-particle-image-velocimetry (3D-2C μ PIV) around a **stagnant** particle, to illustrate the presence of a number of competing effects including dielectrophoresis and electrohydrodynamic flow which distort both the strength and shape of the frequency dispersion predicted for pure induced-charge effects. Here, we extend this work by examining the frequency dispersion of **mobile** Janus particles of different sizes ($3 - 15\mu m$ in diameter) at different electrolyte concentrations. In all cases, towards the DC limit, and in the frequency domain where previously EHD flow was shown to dominate, the velocity of a mobile particle decays to zero. At the same time significant variations in the frequency dispersion, including its shape and the value for maximum velocity are recorded as a function of both electrolyte concentration and particle size. This work is of both fundamental and practical importance and may be used to further refine non-linear electrokinetic theory and optimize the application of Janus particles as carriers in lab-on-a-chip analysis systems.

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