Band Formation in Mixtures of Oppositely Charged Colloids Driven by an ac Electric Field: Supplementary Information

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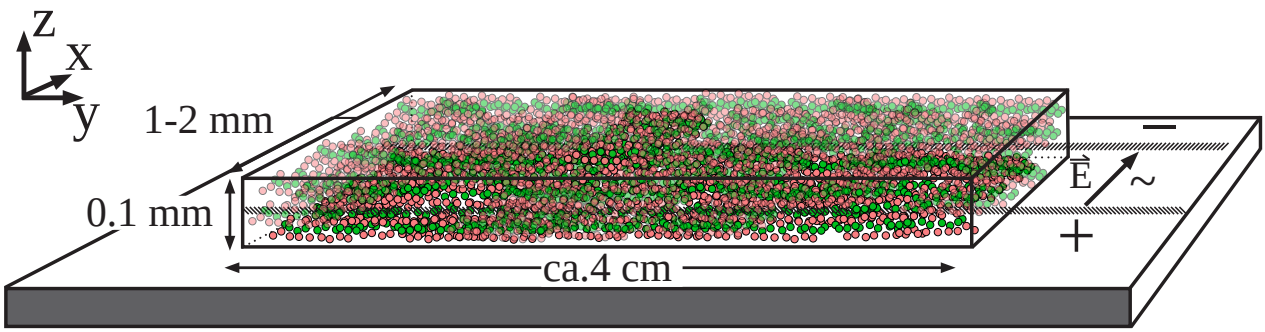
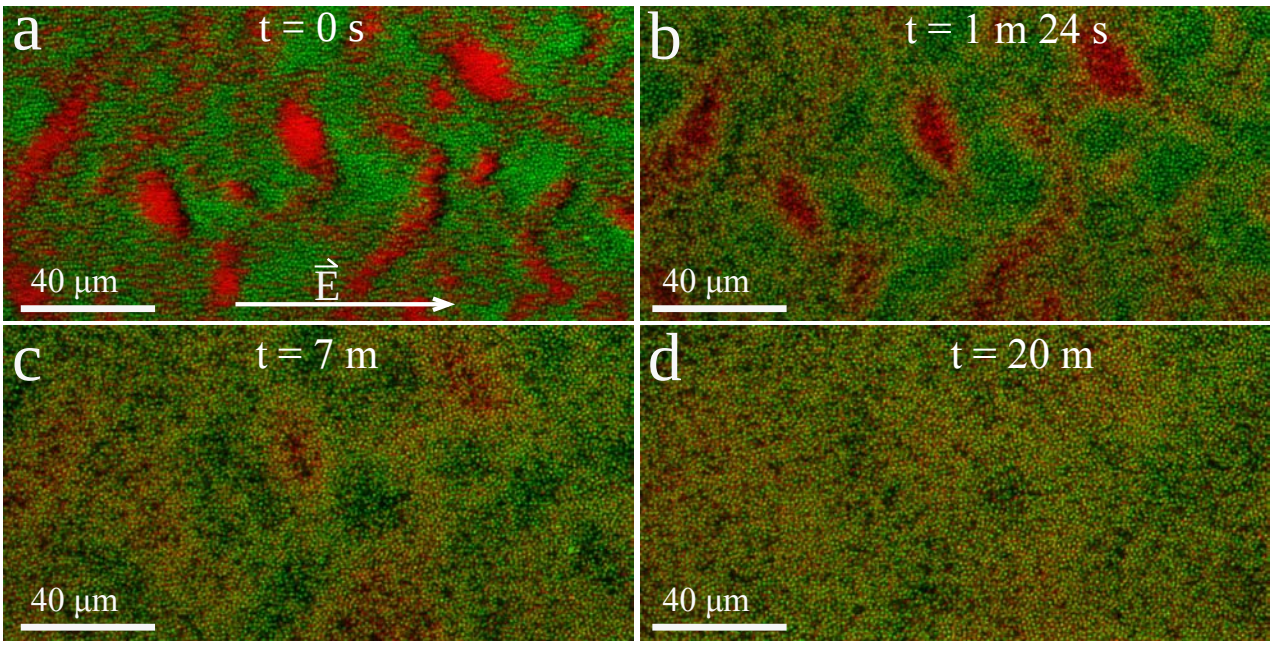
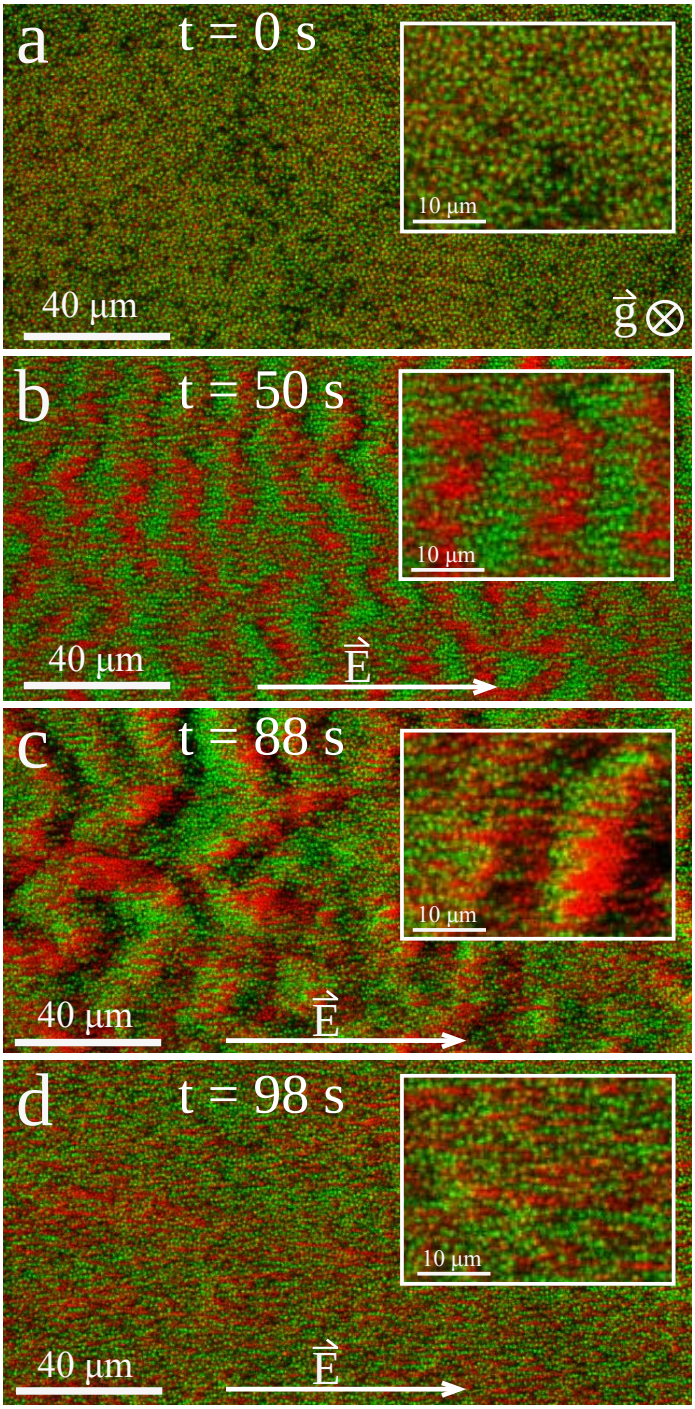


Supplementary Figure 1: A sketch of the experimental setup (not to scale) consisting of a capillary (mounted on a glass plate) containing the binary suspension of oppositely charged particles. After assembling the cell, the capillary on the glass plate was installed upside-down on the stage of the inverted confocal microscope. To study pattern formation, An AC electric field was applied between the electrodes. The negatively charged NBD-labeled particles are color-coded 'green' and the positively charged RAS-labeled particles are color-coded 'red'.



Supplementary Figure 2: Confocal images showing how the bands dissolved by diffusion just after the AC alternating field with strength $|E| = 110$ V/mm and frequency $f = 1.5$ Hz (block function) was turned off at $t = 0$ s. The time-evolution of the system is shown in (a-d). These data show that reaching the homogeneous state takes an order of magnitude longer by diffusion than by driving the system at a frequency below the band formation regime and then switching it off (as in Fig. 2 in the main text).



Supplementary Figure 3: (larger version of Fig. 2a-d in the main text) Typical confocal images of band formation for micron-sized particles. **a:** The initial mixed binary system, **b:** band formation 25 seconds after a field with field strength $|E| = 104$ V/mm and frequency $f = 1.5$ Hz had been switched on, **c:** bands break up just after the frequency had been changed to $f = 0.1$ Hz, and **d:** lanes 10 s after the frequency had been changed to $f = 0.1$ Hz. For each image, a local close-up is shown. Upon turning off the field after (d), a mixed dispersion as shown in (a) was re-obtained.

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