Electronic Supplementary Material (ESI) for Analytical Methods.

Electronic Supplementary Information for:

"Droplet Microfluidics in Thermoplastics: Device Fabrication, Droplet Generation, and Content Manipulation using Integrated Electric and Magnetic Fields"

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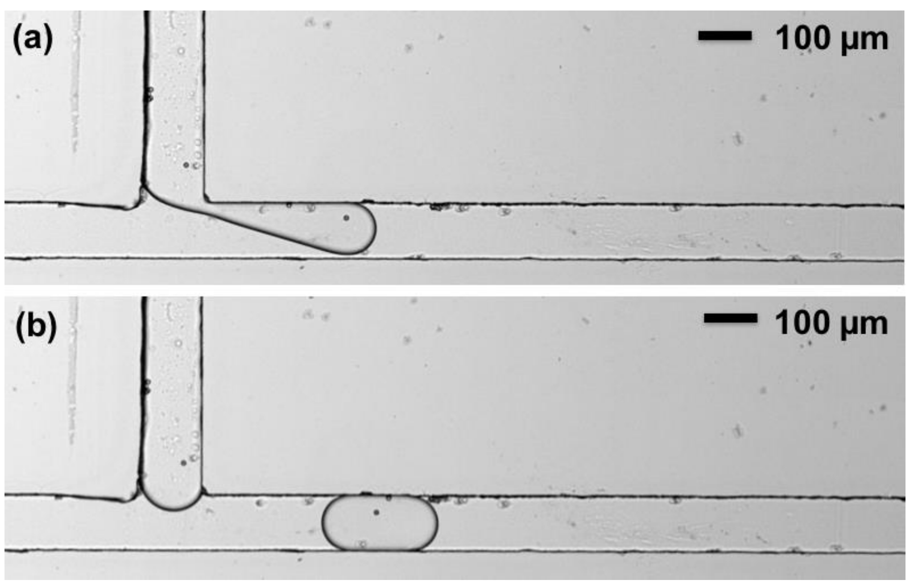
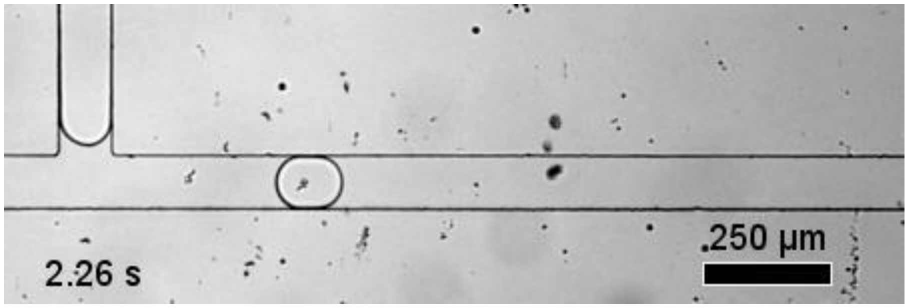
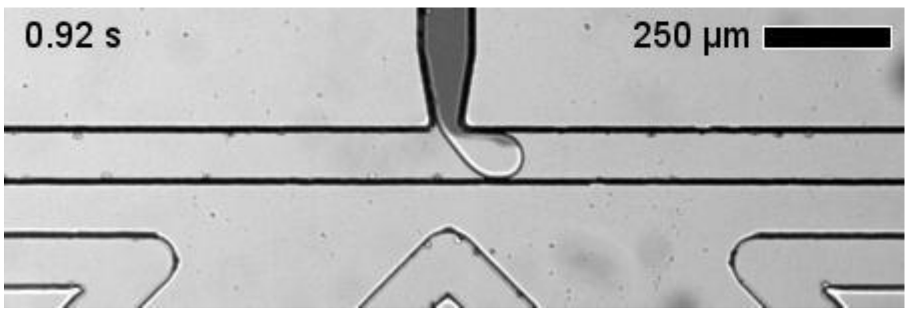


Figure ES1. (a) Droplet generation at the T-junction of an integrated device fabricated in cyclic olefin polymer (COP) via embossing. **(b)** Magnetic beads containing droplet flowing downstream of the T-junction down the main channel.

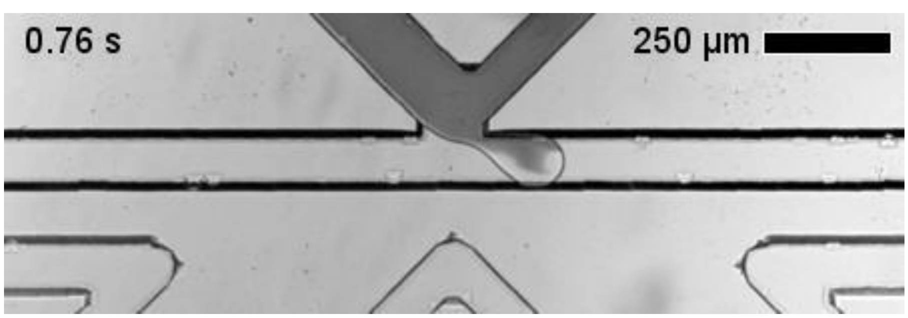
Supplementary Videos:



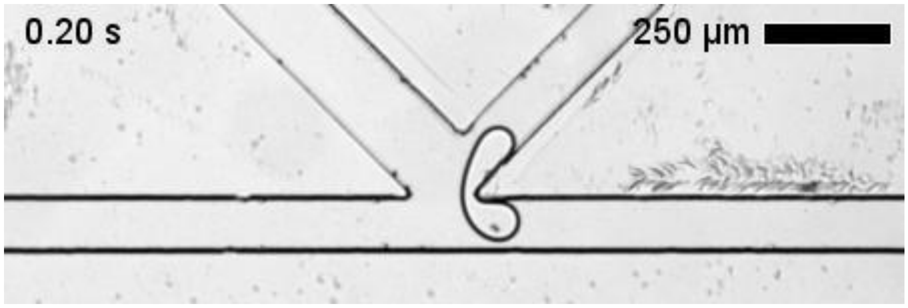
Video ES1: Water droplet generation at the T-junction. Multimedia view.



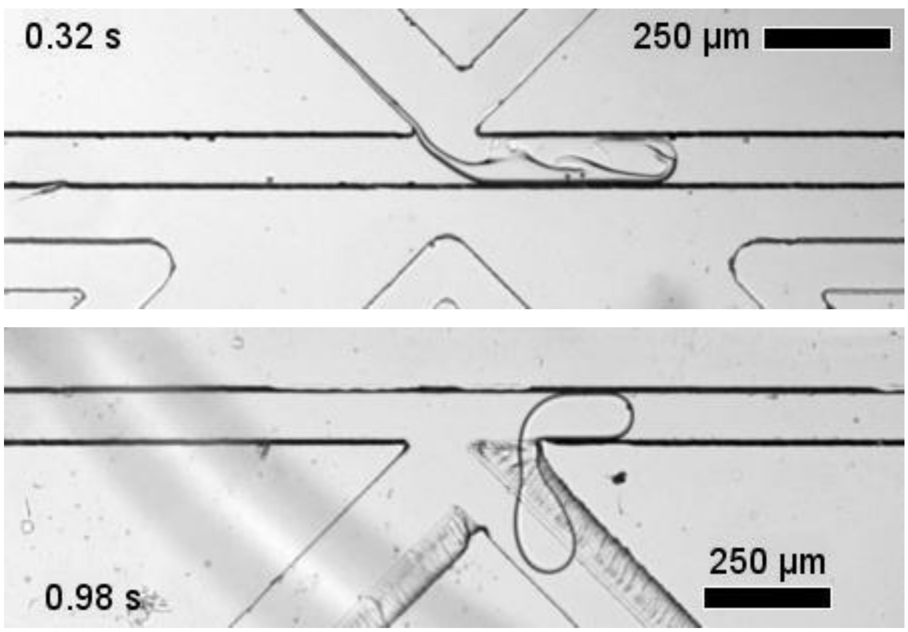
Video ES2: Droplets flow past the picoinjector where dye injects in the presence of electric field. Multimedia view.



Video ES3: Droplets flow past the K-channel where dye injects in the presence of electric field. Multimedia view.



Video ES4: Droplets split at the K-channel, and applied magnetic field concentrates magnetic beads in the main channel (lower) daughter droplets. Some droplets do not have magnetic beads before splitting due to bead sedimentation during loading. Multimedia view.



Video ES5: In the first part of the video, the upstream (first) K-channel injects dye into droplets in the presence of electric field. In the second part of the video, dye-injected droplets split at the downstream (second) K-channel, and magnetic field concentrates beads into the main channel (upper) daughter droplets. Multimedia view.

Video ES6: In the first part of the fluorescence video, the upstream (first) K-channel injects resorufin-β-D-galactopyranoside substrate into the droplets containing β-galactosidase-magnetic bead complexes in the presence of electric field to initiate the reaction. In the second part of the video, these droplets (now also containing significant resorufin product) split at the downstream (second) K-channel, and magnetic field concentrates bead-bound enzyme into the main channel (upper) daughter droplets. Multimedia view.