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Colloidal particle motion in micro galvanic reactors through tailored electrokinetic fluid flow LINDA JAN, CHRISTIAN PUNCKT, Princeton University, Princeton, NJ 08544, BORIS KHUSID, New Jersey Institute of Technology, Newark, NJ 07102, ILHAN A. AKSAY, Princeton University, Princeton, NJ 08544 — Using an array of galvanic micro electrodes (e.g., anodic copper and cathodic gold) in contact with an acidic colloidal suspension, we have previously demonstrated autonomous control of particle trajectory and the location of particle deposition which affected the crystallinity of 2D colloidal crystals on the anodes. Particle velocities and the locations of initial particle deposition are affected by the electrode geometry and reaction time. We now present data on the effects of geometry and time on the copper dissolution rate and the associated electrokinetic phenomena. Particle velocities increase with the copper dissolution rate and the steepness of its lateral variation. Experiments and theoretical results reveal that the different location of deposition is related to the difference in the lateral gradient of the dissolution rate.

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