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Directed Self-Assembly of Colloidal Janus Matchsticks KUNDAN CHAUDHARY, Harvard University, QIAN CHEN, JAIME JUAREZ, STEVE GRANICK, University of Illinois at Urbana-Champaign, JENNIFER LEWIS, Harvard University — The ability to assemble anisotropic colloidal building blocks into ordered configurations is scientifically and technologically important for developing new classes of soft materials. We are studying the fabrication and electric field driven assembly of end- and side-coated Janus rods. Specifically, we fabricate silica rods (L/D = 2-4) functionalized with hydrophobic gold (Au) patches using a multistep process involving electric field alignment and crystallization, microcontact printing, and selective metallization. In the absence of an applied electric filed, the Janus matchsticks (end-coated rods) self-assemble into multi pods (e.g., bi-, tri- and tetrapods) of varying coordination number and patch angle in aqueous solution. By contrast, both Janus matchsticks and side-coated Janus rods form complex chains in applied AC electric fields of varying magnitude and frequency, whose configurations vary significantly from those formed by pure silica rods.

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