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Propulsion of magnetically actuated achiral swimmers in complex fluids.[1] ZHI CHEN, ZIHAN WANG, Department of Mechanical and Energy Engineering, Southern University of Science and Technology, Shenzhen, China, DAVID QUASHIE, PRATEEK BENHAL1, JAMEL ALI, Department of Chemical and Biomedical Engineering, FAMU-FSU College of Engineering; National High Magnetic Field Laboratory, Tallahassee, Florida, USA, U KEI CHEANG, Department of Mechanical and Energy Engineering, Southern University of Science and Technology, Shenzhen, China — Recently reported achiral microswimmers can be massively fabricated at low cost and are envisioned for used in future in vivo biomedical applications, such as drug delivery and minimally invasive surgeries. Towards this goal, we report on the propulsion of two-dimensional magnetic microswimmers, fabricated through photolithography, and actuated in dilute methylcellulose solutions. We observed that the microswimmers displayed increased swimming speeds in certain polymer concentrations. Furthermore, we observed that the reduction rate of achiral microswimmers' precession angle increases with the concentration of the polymer weight percent. Upon understanding the underlying principles, more effective control strategies can be implemented on achiral microswimmers to perform biomedical tasks. These observations suggest that achiral microswimmers have similar speed enhancement to those well known to exist for chiral simmers in complex media.

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