Abstract Submitted
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A thermal sensitization approach toward the nano/microstructuring of binary alloy surfaces to tune their wettability.[1] HAMED VAHABI, WEI WANG, KETUL POPAT, Colorado State University, GIBUM KOWN, University of Kansas, TROY HOLLAND, ARUN KOTA, Colorado State University — Superhydrophobic surfaces (i.e., surfaces extremely repellent to water) allow water droplets to bead up and easily roll off from the surface. While a few methods have been developed to fabricate metallic superhydrophobic surfaces, these methods typically involve expensive equipment, environmental hazards, or multi-step processes. In this work, we developed a universal, scalable, solvent-free, one-step methodology based on thermal sensitization to create appropriate surface texture and fabricate metallic superhydrophobic surfaces. To demonstrate the feasibility of our methodology and elucidate the underlying mechanism, we fabricated superhydrophobic surfaces using ferritic (430) and austenitic (316) stainless steels (representative alloys) with roll off angles as low as 4and 7, respectively. We envision that our approach will enable the fabrication of superhydrophobic metal alloys for a wide range of civilian and military applications. [http://dx.doi.org/10.1063/1.4989577]

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Hamed Vahabi
Colorado State University

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