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Fabrication of superamphiphobic Cu surfaces using hierarchical surface morphology and fluorocarbon attachment facilitated by plasma activation

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ABSTRACT: A simple and robust method for designed fabrication of a superamphiphobic surfaces by template-free chemical deposition of Cu micro-cone arrays, followed by air plasma activation and room-temperature treatment in tridecafluoro-1,1,2,2-tetrahydrooctyl trichlorosilane (FTS) is reported in this paper. Only treated 15 min by FTS, a water contact angle of 166.1° and an oil (diiodomethane, CH₂I₂) contact angle of 160.5° are reached on the Cu surfaces. The highest oil contact angle of 168.1° is achieved after treated 1h by FTS. Such surfaces also display enhanced corrosion resistance due to the combination of the FTS layer and air pockets which prevent the ion diffusion to the internal copper.

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