Wet Chemical Etching of FeCrAl alloy for Microreactor Fabrication

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Microreactors are finding increasing applications in the field of chemistry. In the past few years, microreactor chemistry has shown a great promise as a novel method on which to build new chemical technology and processes. To fabricate a microreactor, it is important to etch reactor materials such as glass, ceramic, and alloy for a pattern transfer. In this work, the wet chemical etching characteristics of FeCrAl alloy was investigated in terms of etch rate, surface morphology and etch profile by using various etching solutions. FeCrAl alloy was etched with H_2SO_4 and HCl solutions. When FeCrAl alloy was etched at a high concentration, the etch rate was faster than at a low concentration, but the etched surface of the former showed a rougher surface with etch residues. In the case of H_2SO_4 solution, the etched surface was relatively clean and smooth. The etch profile was a function of etching solution species and concentration.