

Abstract Submitted
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Spontaneous Microfaceting and Pyramid Formation during Si(100) Etching MELISSA HINES, MARC FAGGIN, ANKUSH GUPTA, Cornell University — The spontaneous, etching-induced transformation of an initially flat Si(100) surface to a completely nanofaceted morphology consisting of overlapping pyramidal hillocks has been observed using a combination of morphological and spectroscopic probes and modeled using a kinetic Monte Carlo (KMC) simulation of Si(100) etching. The morphological transformation is driven by highly anisotropic chemical reactions that generate self-propagating pyramidal features with near-perfect microfacets. The atomic-scale mechanism of this etching-induced transformation will be discussed. In contrast to the more commonly studied Si(111) surface, the reactivity of the (100) face is dominated by interadsorbate strain.

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