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Step Arrays on Vicinal SiC Formed by Hydrogen-Etching S. NIE, R.M. FEENSTRA, Carnegie Mellon Univ, Y. KE, R.P. DEVATY, W.J. CHOYKE, Univ Pittsburgh, G. GU, Sarnoff Corp — SiC is a useful substrate for heteroepitaxy, with step arrays on the surface used to minimize defects in the film [1]. We have studied the formation of steps on SiC surfaces using H-etching at 1600 $^\circ$C. Both Si-face, (0001), and C-face, (000$\underline{1}$), surfaces are used, with miscut angles of 0, 3.5 $^\circ$, and 12 $^\circ$ towards <1$\underline{1}$00> or <11$\underline{2}$0> directions. For H-etched surfaces it is known that steps tend to form with full unit-cell height (1.5 nm for 6H-SiC) and with step edges perpendicular to <1$\underline{1}$00> [2]. Accordingly, we find that miscuts towards <1$\underline{1}$00> result in ordered arrays of steps. On the Si-face step bunching is observed, with typical step heights of 4.5 nm for 12 $^\circ$ miscut. In contrast, for the C-face, little step bunching is observed, with the surface forming well ordered arrays of single-unit-cell-high steps. For the case of miscut towards <11$\underline{2}$0> the situation is more complicated, with meandering steps observed. We conclude that the C-face is most ideal as a vicinal template. Supported by NSF.
[1] C.D. Lee et al. MIJ-NSR **7**, 2 (2002).
[2] V. Ramachandran et al. JEM **27**, 308 (1998).

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