In some embodiments, the at least one polyamine can be from at least about 0.001 wt% (e.g., at least about 0.002 wt%, at least about 0.005 wt%, at least about 0.01 wt%, at least about 0.02 wt%, at least about 0.04 wt%, or at least about 0.05 wt%) to at most about 0.5 wt% (e.g., at most about 0.4 wt%, at most about 0.3 wt%, at most about 0.2 wt%, at most about 0.1 wt%, at most about 0.08 wt%, at most about 0.06 wt%, or at most about 0.05 wt%) of the etching composition. Without wishing to be bound by theory, it is believed that including a polyamine in the etching composition of this disclosure can inhibit the etch rate of SiGe doped with boron.

In some embodiments, the etching composition of this disclosure can optionally further include at least one (e.g., two, three, or four) silane (e.g., 3-aminopropyl triethoxysilane). In some embodiments, the at least one silane comprises a silane of formula (III):

$$Si\text{-}R_4R_5R_6R_7 \text{ (III)},$$

in which each of R_4, R_5, R_6, and R_7, independently, is N(RR'), RC(O)O, C_1-C_8 alkoxy (e.g., methoxy or ethyoxy), C_1-C_{18} alkyl (e.g., methyl, butyl, hexyl, octyl, dodecyl, or octadecyl) optionally substituted by N(RR') or Si($R_aR_bR_c$). Each of R and R', independently, is H, C_1-C_{10} alkyl and each of R_a, R_b, and R_c, independently, is C_1-C_{10} alkyl or C_1-C_{10} alkoxy. Examples of suitable silanes include 3-aminopropyl triethoxysilane, methyltrimethoxysilane, dimethylaminotrimethylsilane, acetoxytrimethylsilane, octyltrimethoxysilane, butyltrimethoxysilane, dodecyltrimethoxysilane, hexyltrimethoxysilane, octadecyltrimethoxysilane, or bis(trimethoxysilyl)methane.

In some embodiments, the at least one silane can be from at least about 0.001 wt% (e.g., at least about 0.002 wt%, at least about 0.005 wt%, at least about 0.01 wt%, at least about 0.02 wt%, at least about 0.04 wt%, or at least about 0.05 wt%) to at most about 0.5 wt% (e.g., at most about 0.4 wt%, at most about 0.3 wt%, at most about 0.2 wt%, at most about 0.1 wt%, at most about 0.08 wt%, at most about 0.06 wt%, or at most about 0.05 wt%) of the etching composition. Without wishing to be bound by theory, it is believed that including a silane in the etching composition of this disclosure can inhibit the etch rate of SiGe doped with boron.