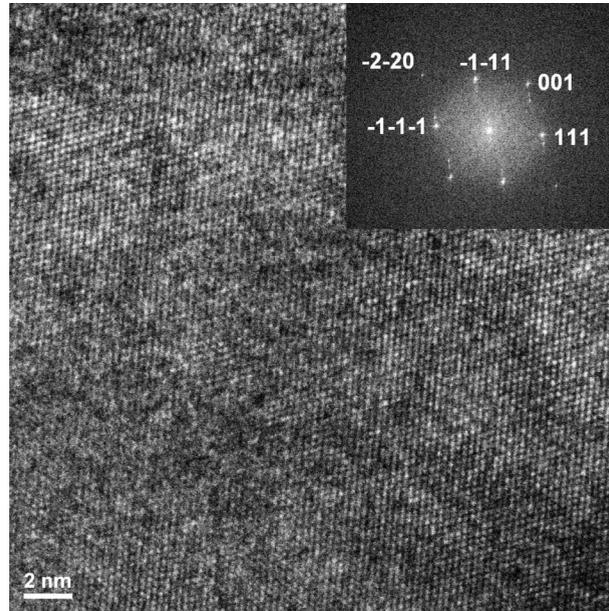
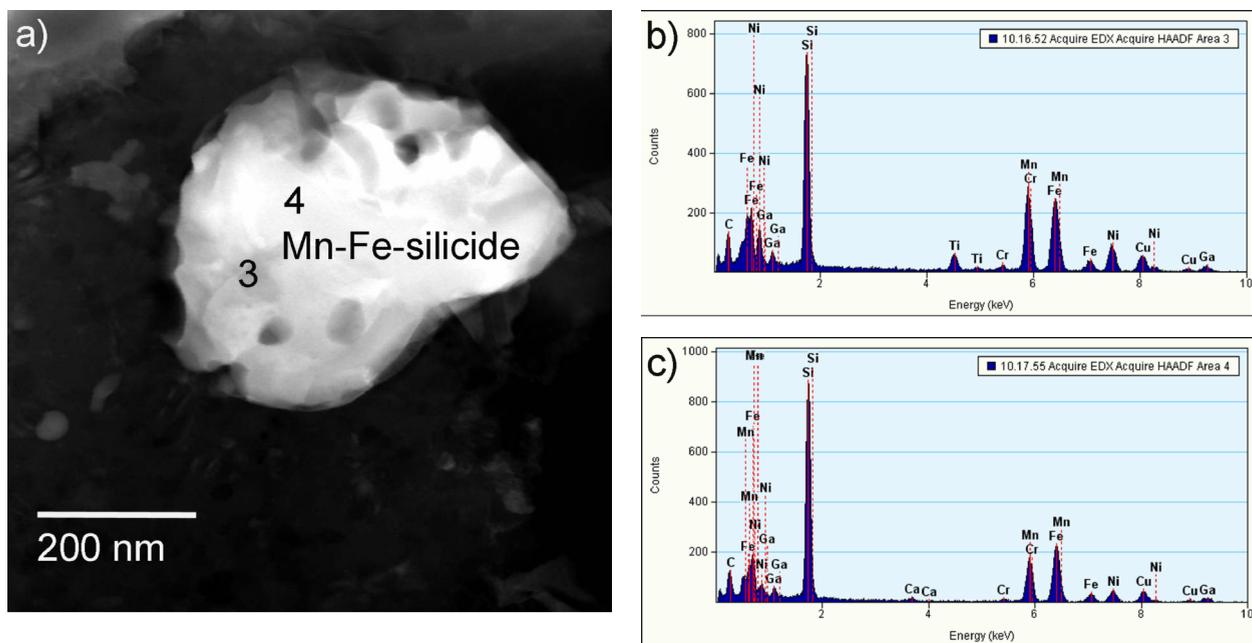


SUPPLEMENTAL FIGURE S1. Structure and composition of tilleyite. (a) High-resolution lattice fringe image of grain HREM02 from foil #4975. The inset shows the indexed diffraction pattern according to tilleyite. The observed d -spacings are presented in Supplementary Table 1. (b and c) EDX spectra of crystalline (b) and amorphous (c) tilleyite, showing their similar chemical compositions. In these and other EDX spectra, the $\text{CuK}\alpha$ X-ray intensity is due to the copper grid on which the sample rests, and the Ga X-ray intensity represents gallium implanted during the FIB sputtering.



SUPPLEMENTAL FIGURE S2. High-resolution lattice fringe image of SiC indexed based on a cubic structure. Indexed diffraction pattern in the upper right corner. Foil #5317C.



SUPPLEMENTAL FIGURE S3. Fe-Ni-Mn-Cr silicide in foil #4975 with variable chemical composition. (a) TEM bright-field image. Numbers 3 and 4 indicate the locations of the analyses given in b and c. (b and c) EDX spectra collected at locations 3 and 4, respectively. While Fe peak intensities are almost similar in both spectra, the Si peak is significantly more intense and Mn and Ni peaks are significantly less intense in spectrum location 4 (spectrum “c”), while the Ti peak occurs only in spectrum location 3 (spectrum “b”); this reflects the variable chemical compositions observed in locations 3 and 4 (see Table 1).