

SUPPLEMENTARY INFORMATION:

Understanding Silicon Monoxide Evolution from Mixed Silicon and Silica Powders

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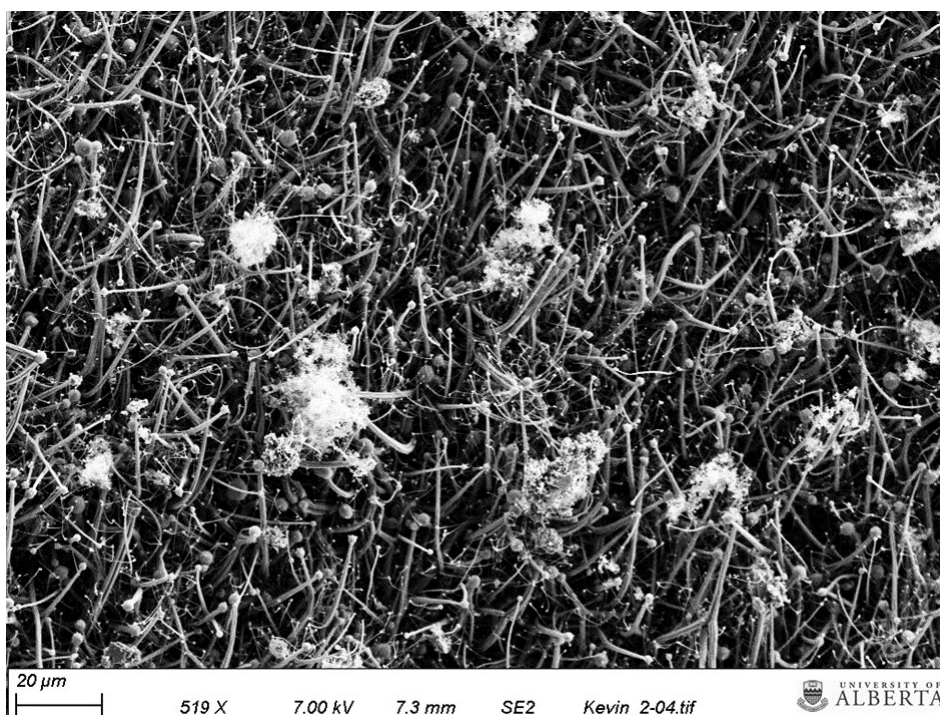


Figure S1. SEM of silicon nanowires produced by deposition of silicon monoxide gas.

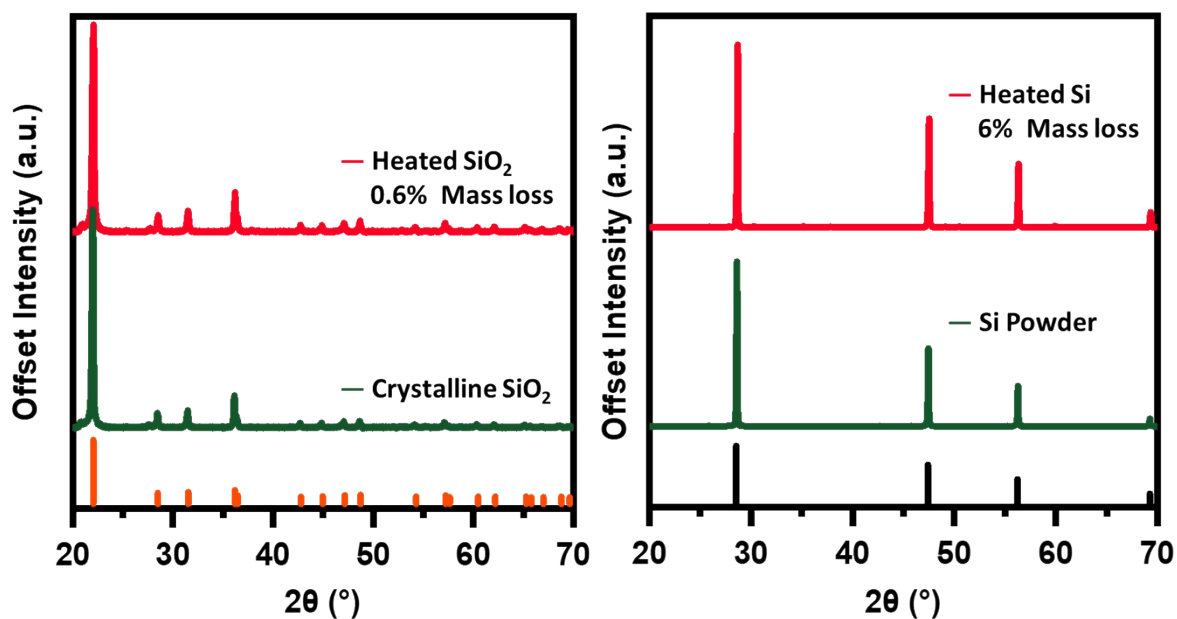


Figure S2. Mass loss and pXRD of silica and silicon heated separately. (a) Bulk crystalline SiO₂ (cristobalite) heated independently (without silicon) to 1400°C for 5 hours; (b) silicon powder heated independently (without silica) to 1300°C for 5 hours.

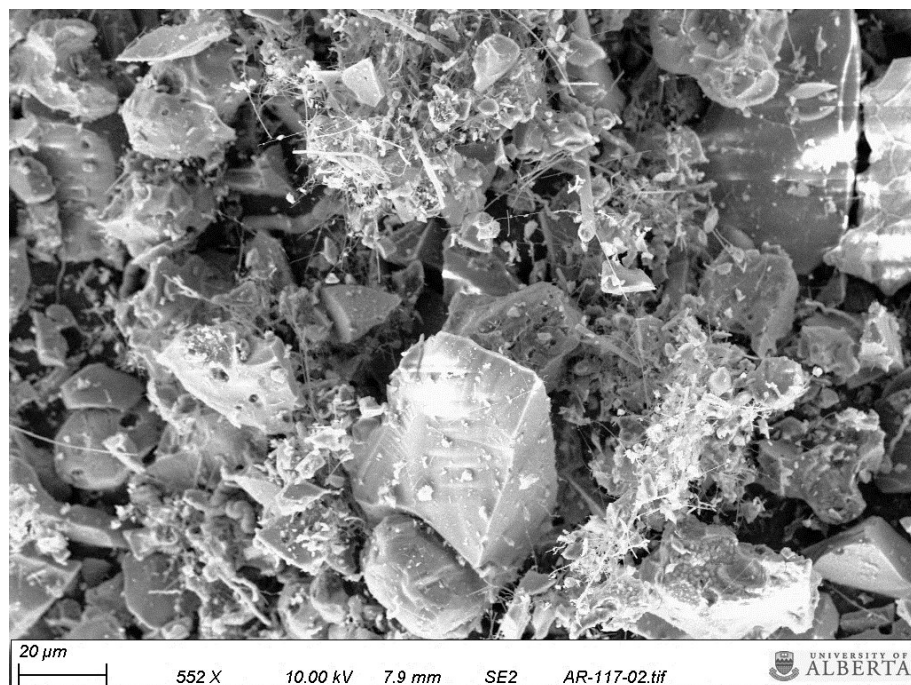


Figure S3. Nanowires on the silica/silicon mixtures after thermal treatment.

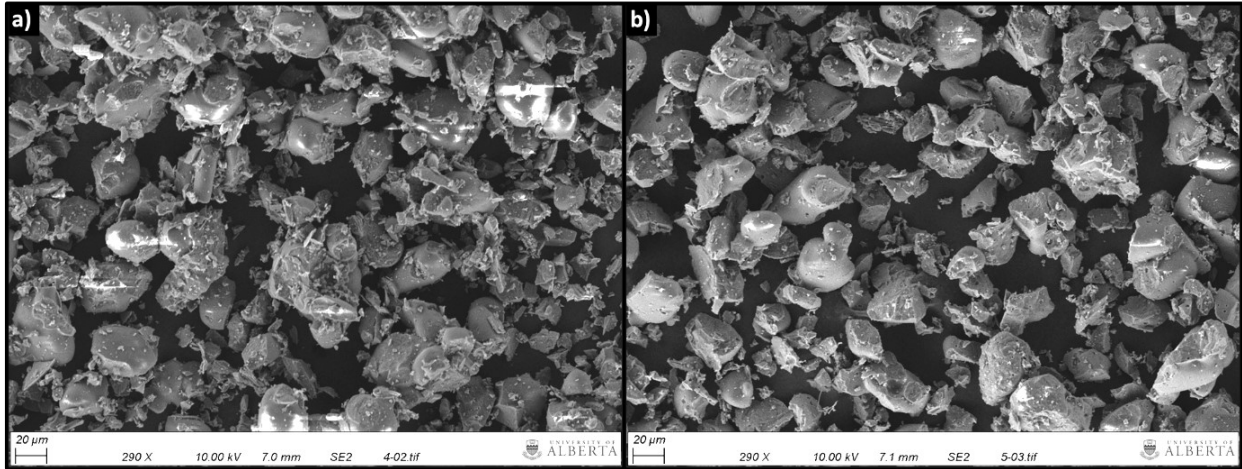


Figure S4. SEM of silicon/silica powder mixtures before and after heating.

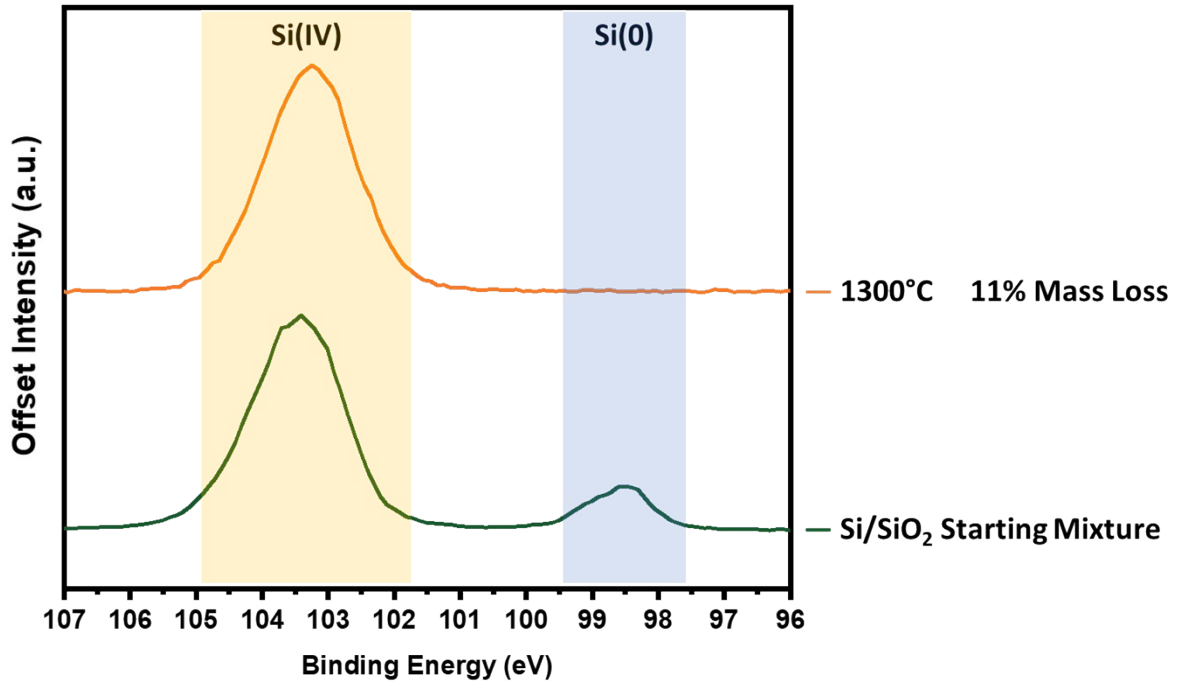


Figure S5. XPS of silicon/silica powder mixtures before and after heating.

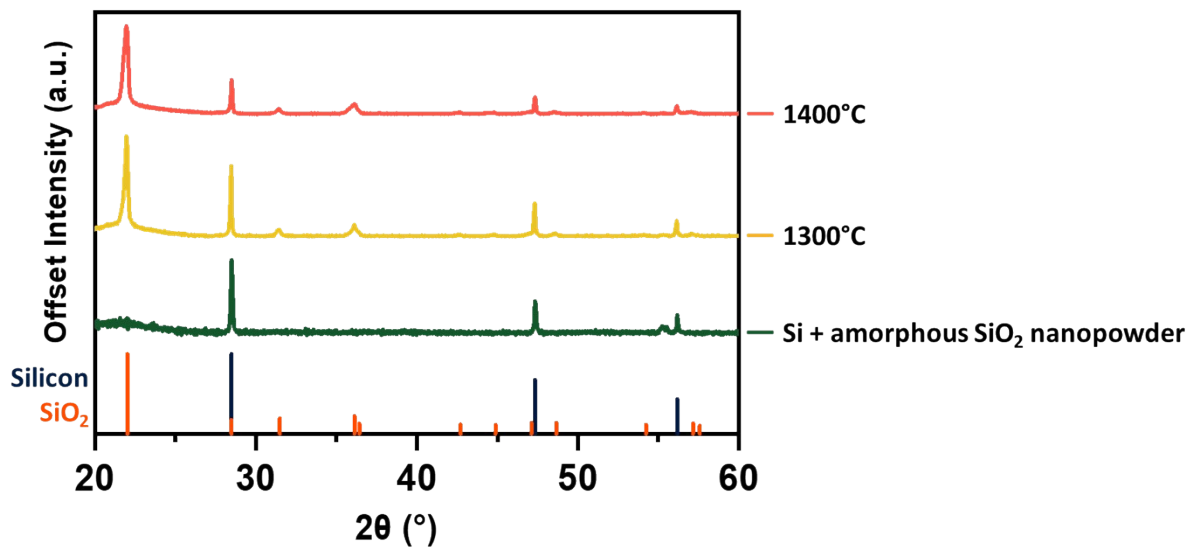


Figure S6. Powder X-ray diffraction pattern of silica/silicon mixtures (20:1 by mass), using amorphous silica nanopowder, before and after heating.

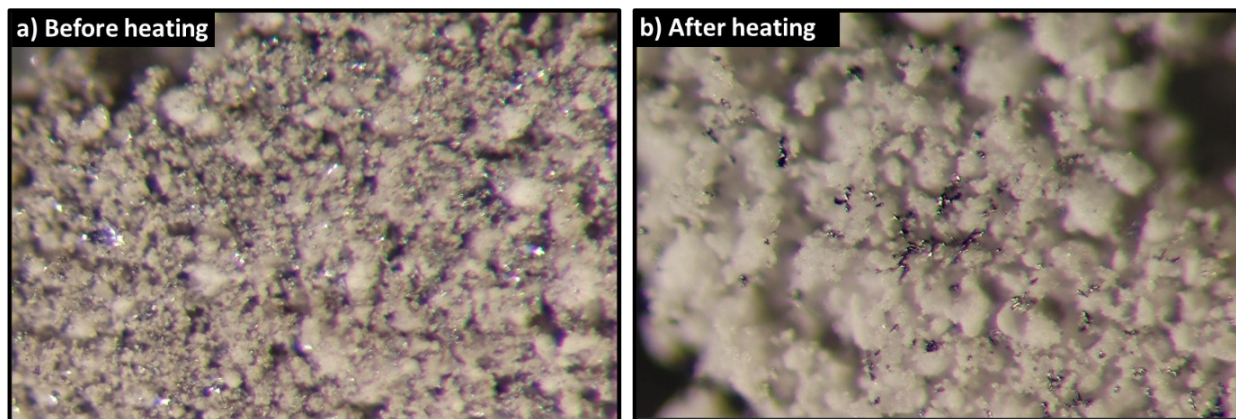


Figure S7. Optical images (magnification 160x) of silicon/silica powder mixtures before (a) and after (b) thermal treatment at 1400°C for 5 hours. Silicon to silica ratio 1:4 by mass. Larger relative quantities of silicon results in the Si microparticles melting together after heating.

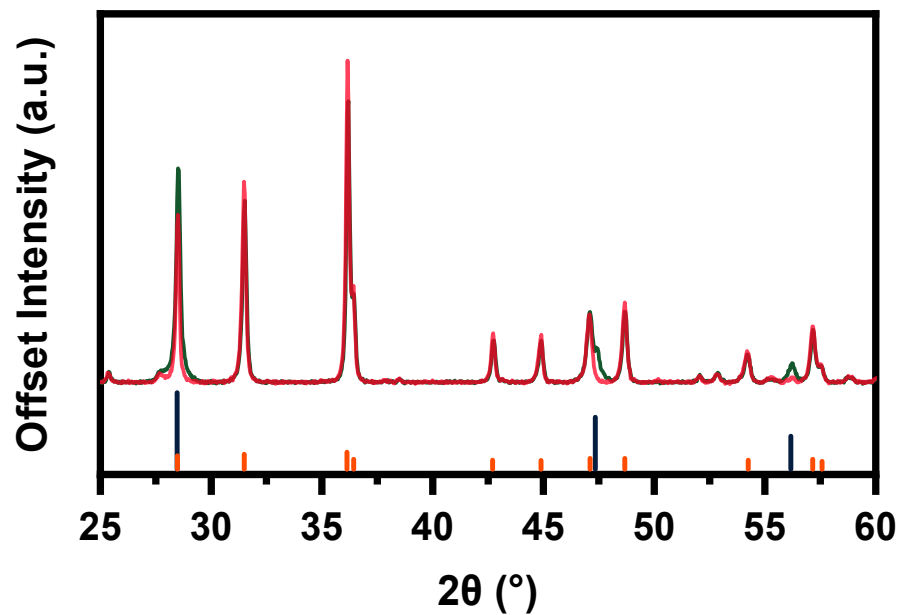


Figure S8. Overlaid powder XRD patterns for mixtures of silicon nanoparticles with crystalline SiO₂ (cristobalite) before (green) and after (red) heating at 1300°C for 1 hour. The diffraction peaks associated with Si and SiO₂ are presented below the patterns in blue and orange, respectively. After heating, the peak at 56.2° and the shoulder at 47.4° disappears, indicating a loss of crystalline Si. The peak at 28.5° also becomes less intense.