Supplementary information

Preparation and functionalization of hydride terminated porous germanium

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Thermal stability

The native Ge-H_x terminated surface is surprisingly resistant to boiling aqueous conditions, in light of the known instability of Ge-H_x groups on flat surfaces under ambient conditions. PG was immersed in aerated boiling water, with or without 25% v/v of ethanol for 5, 10, 20, and 70 min which resulted in a ~50% decrease of total Ge-H_x intensities (Fig. SI1a). Thermal oxidation in air at 100 ^{o}C also showed little effect after 1 h, but after 12 h, the Ge-H_x vibrations are essentially removed (Fig SI1b).

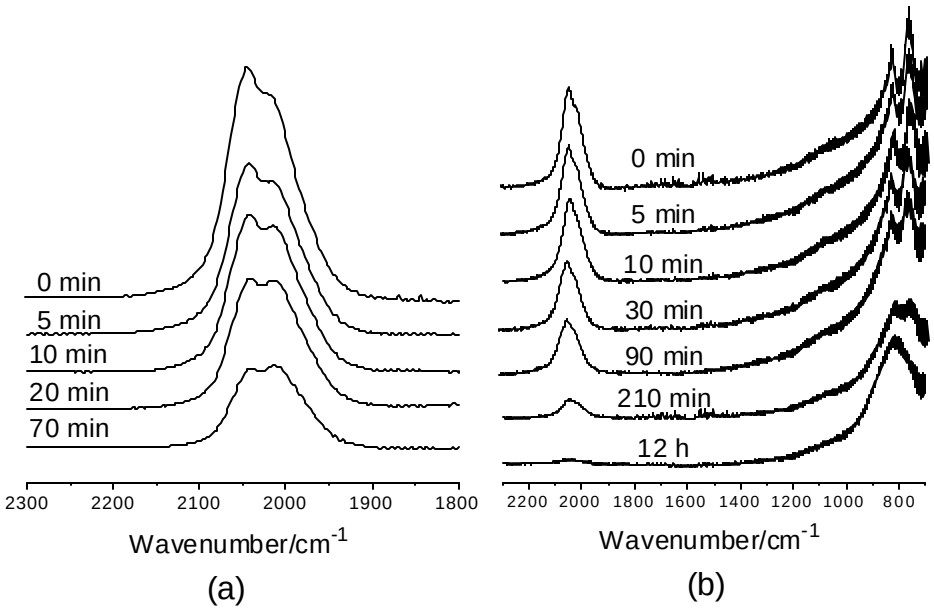
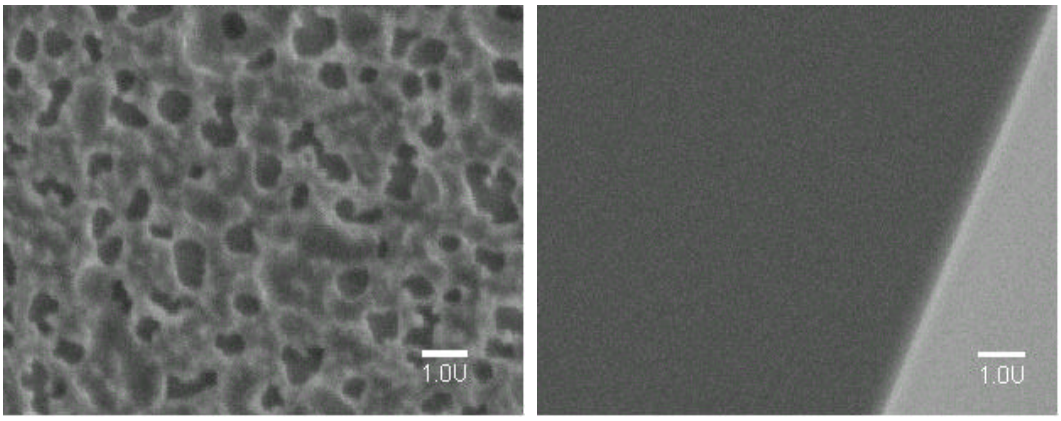
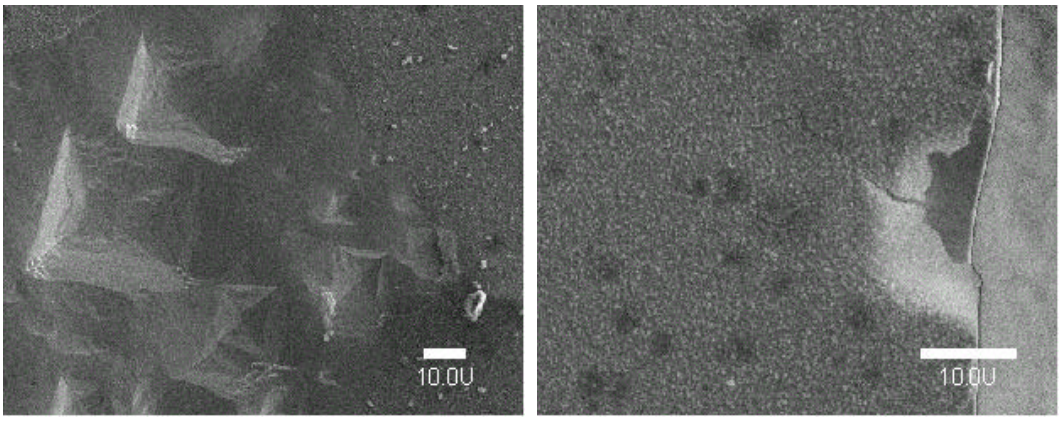


Fig. SI1 FTIR studies of stability tests of PG in boiling water (a) and in oven at 100 ºC (b).



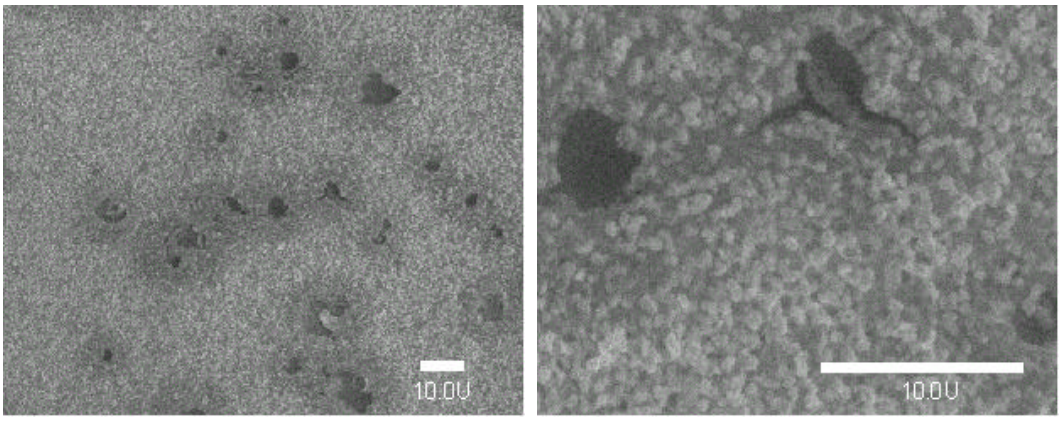
(a) (b)

Fig. SI2 SEM of the surface features of n^+ type germanium after (a) 2 min and (b) 5 min anodization under 350 mA/cm^2. Oxide layer formed during first 2 min of anodization dissolved during next 3 min of anodization. Diagonally fractured top surface was included in (b) in order to compare the cleanliness of the top surface.



(a) (b)

Fig. SI3 SEM (plan view) of n^+ type PG. Pyramidal shape surface features (a) and nanoparticles (b) are shown.



(a) (b)

Fig. SI4 SEM of the plan view of p type PG. Submicron-sized particles were found around the edge of the sample. Fractured areas and nanoparticles are seen under lower (a) and higher magnification (b).

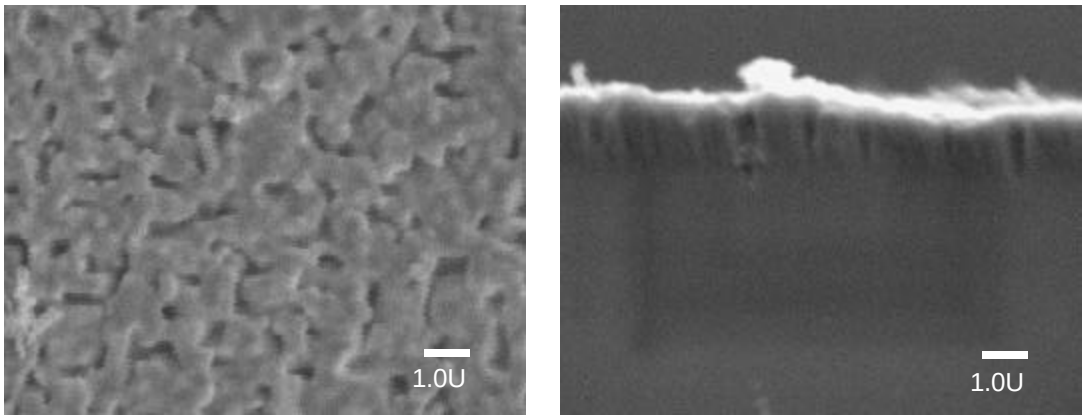


Fig. SI5 Plan and cross-sectional view of (a and (b) p type derived PG.