Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Selective dual-side functionalization of hollow SiO_2 micropillar arrays for biotechnological applications

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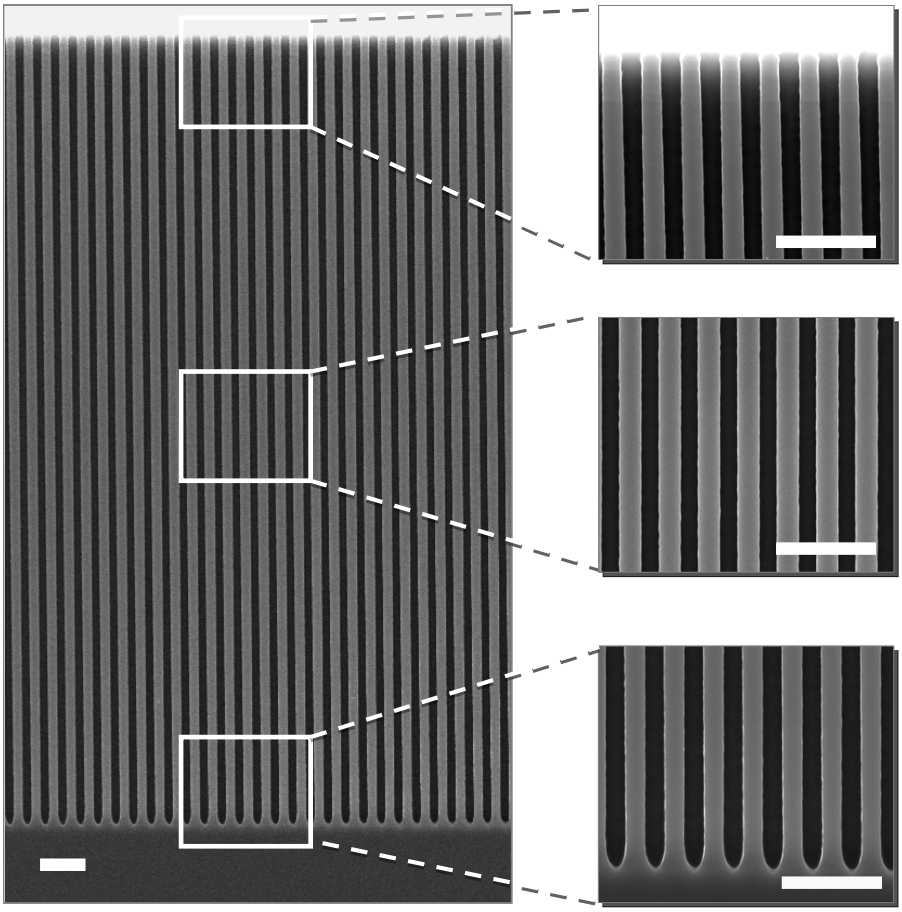

Fig. S1. Cross-view SEM micrograph of a 150 m-thick macroporous silicon. Zoomed images at different depths display uniform pores in diameter and smooth wall surfaces. Scale bar: 10 μm.

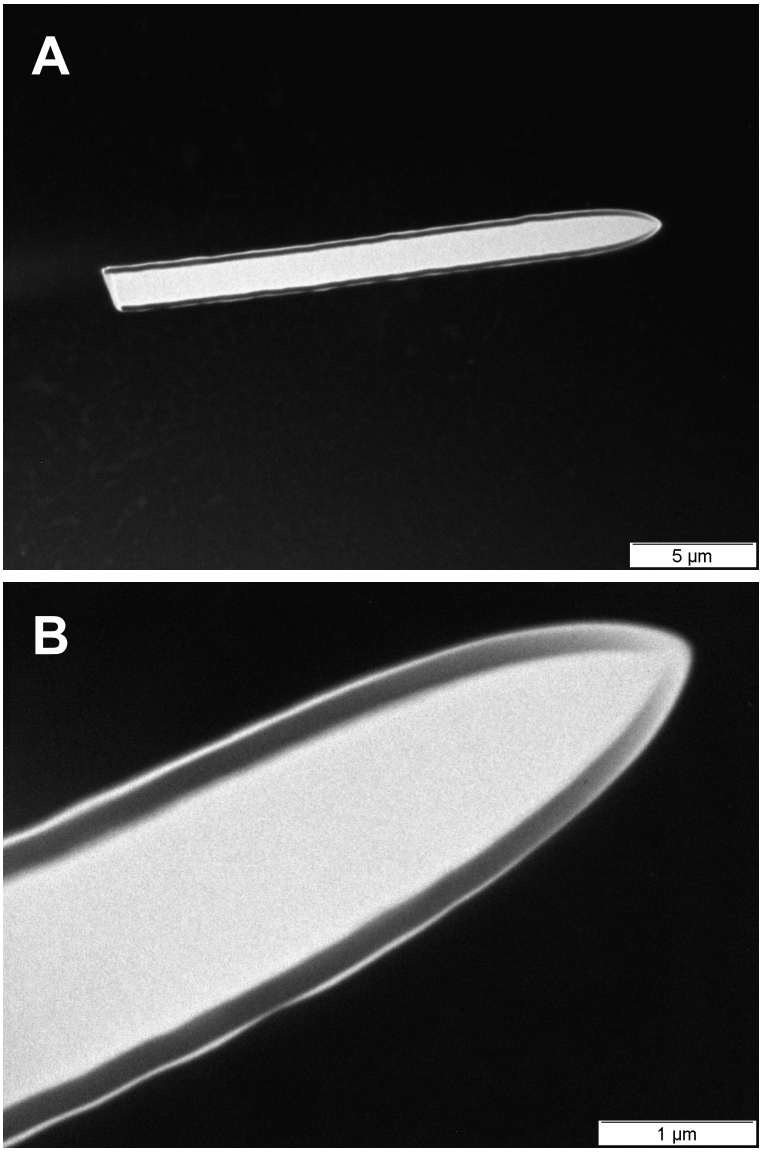

Fig. S2. Dark-field TEM images of A)a single broken micropillar. showing a uniform SiO_2 wall and a hollow structure; B) a detail of the micropillar tip

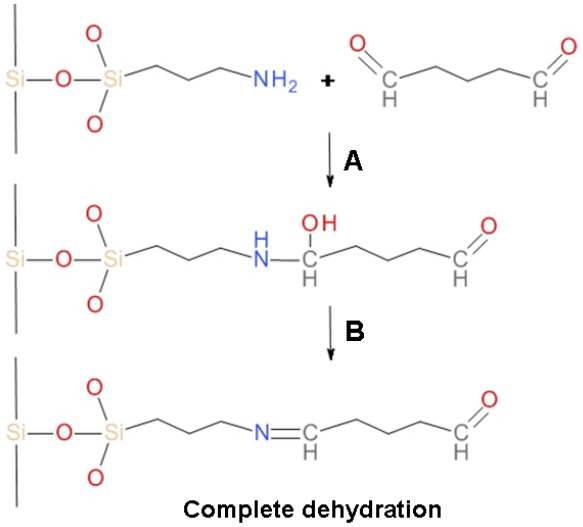

Fig. S3. Schematic representation of the GTA reaction onto APTES. A) Partial dehydration of the primary amine into a secondary amine; B) complete dehydration of the secondary amine into an imine group.

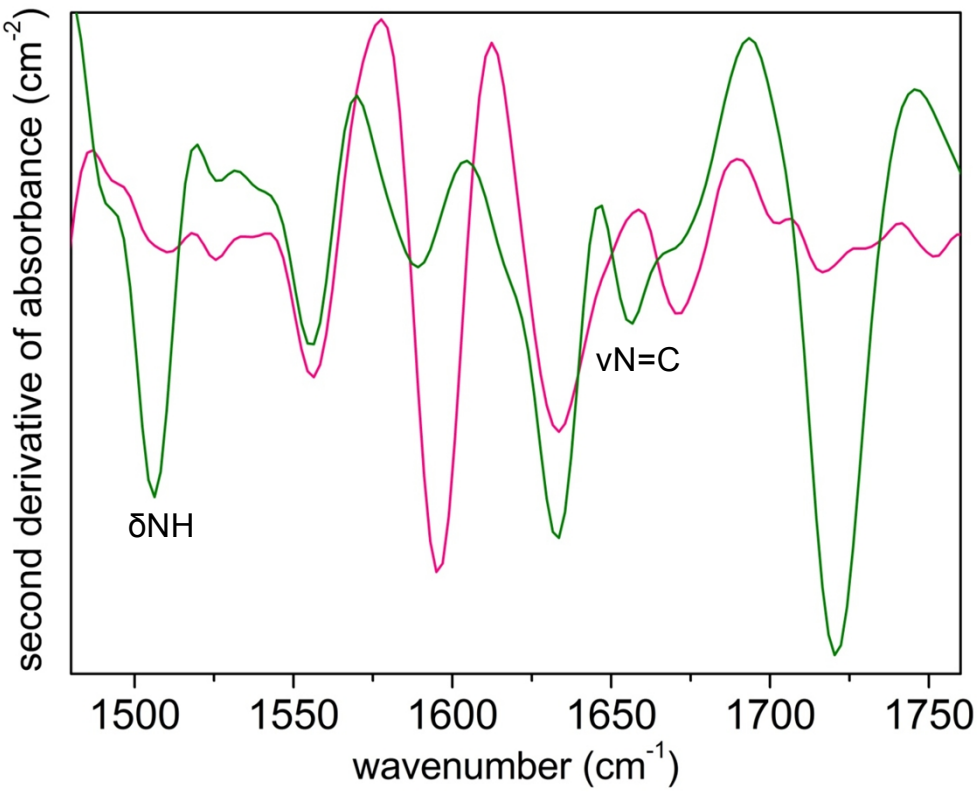

Fig. S4. Second derivative FT-IR spectra of a nanoporous sample after functionalization with APTES (green line) and subsequent GTA docking (pink line). The minimum at 1506 cm^{-1} falls in the region of the secondary amine secondary amine δNH (1490-1580 cm^{-1}), whereas the minimum at 1656 cm^{-1} is in the region of νN=C(1660-1675 cm^{-1}). Assuming these assignments are correct, this implies there is equilibrium in the GTA docking on APTES between the partially and completely dehydrated forms.

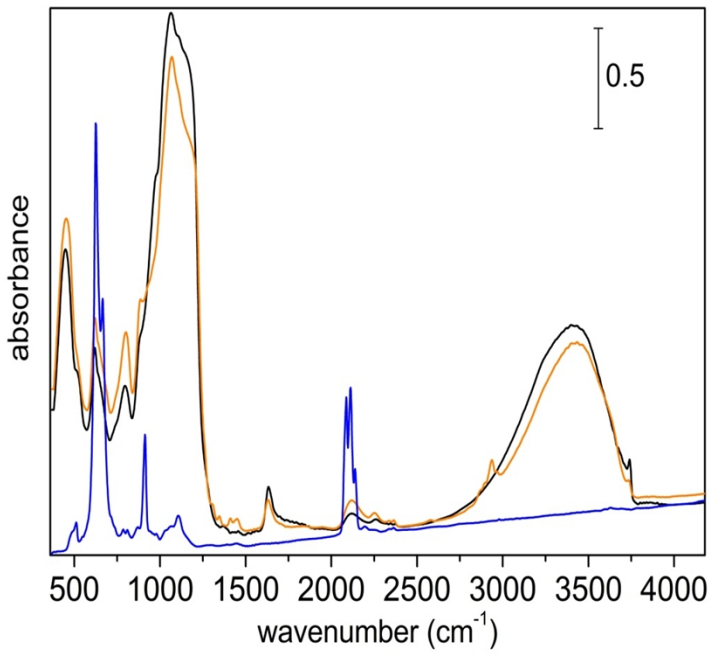

Fig. S5. FT-IR spectra of a nanoporous sample freshly etched (H-terminated, blue line), after oxidation (OH-terminated, black line) and after MPTMS functionalization (SH-terminated, orange line).

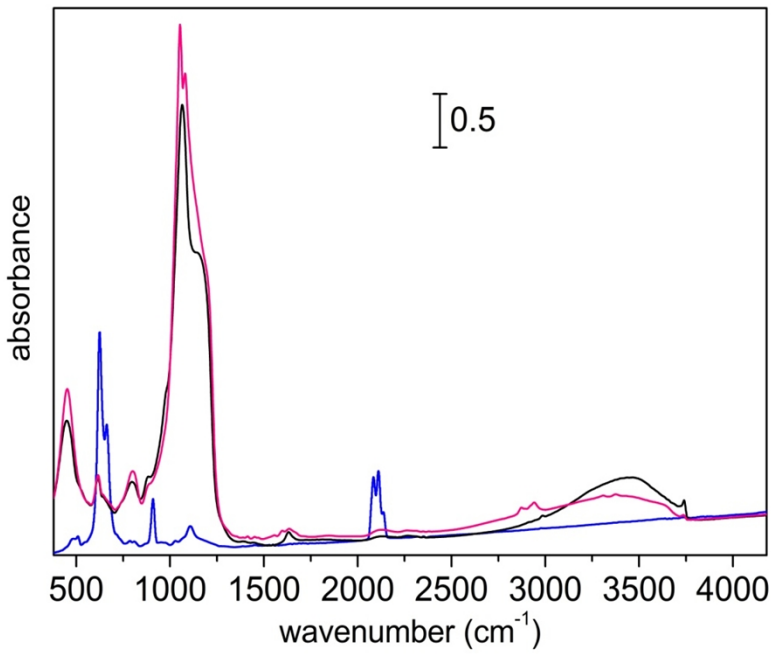

Fig. S6. FT-IR spectra of a nanoporous sample freshly etched (H-terminated, blue line), after oxidation (OH-terminated, black line) and after MPMS functionalization (NH_2-terminated, pink line).