Chemical Science

Supplementary information for

Ultra-fast Framework Stabilization of Ge-Rich Zeolites by Low-Temperature Plasma Treatment

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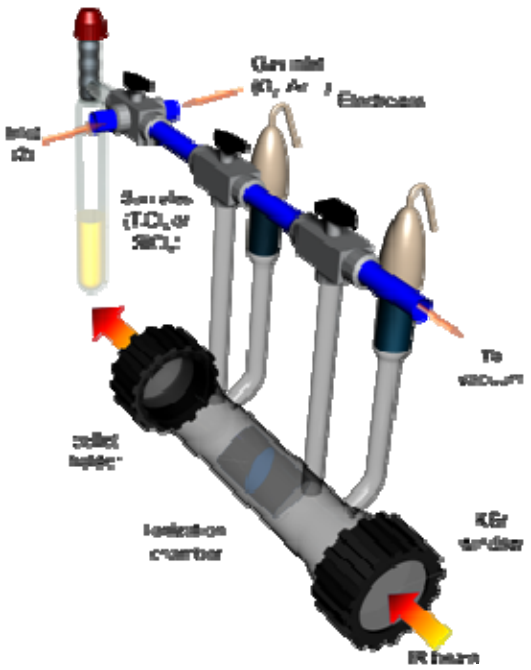

Figure S1. Plasma reactor coupled to IR in situ cell.

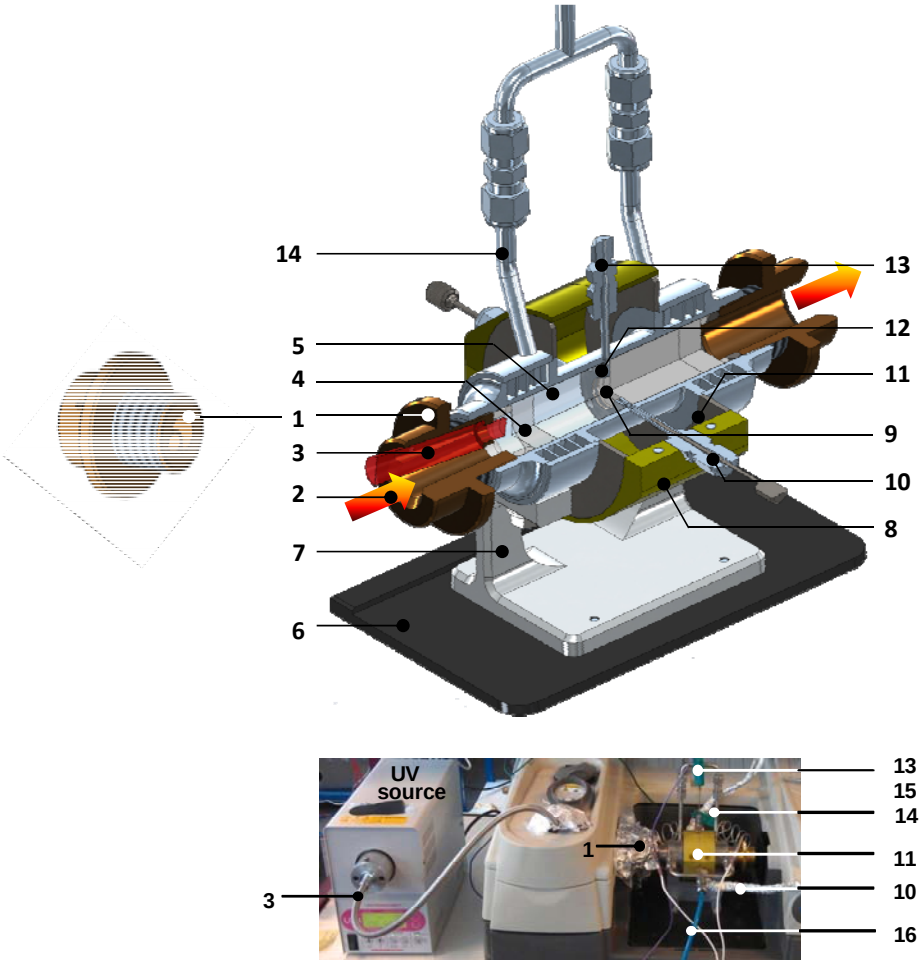

Figure S2. The “sandwich” reactor-IR cell modified for studying UV photocatalysis: (1) Adjusting nut for air tightness (modified for UV-guid position), (2) IR beam, (3) UV-light guide, (4) Kalrez O-ring, (5) KBr windows, (6) Spectrometer base-plate, (7) IR cell support, (8) Oven location, (9) Sample (wafer), (10) Gas inlet, (11) External shell, (12) Wafer holder, (13) Thermocouple location, (14) Air cooling outlet, (15) Gas outlet, (16) Air cooling inlet.

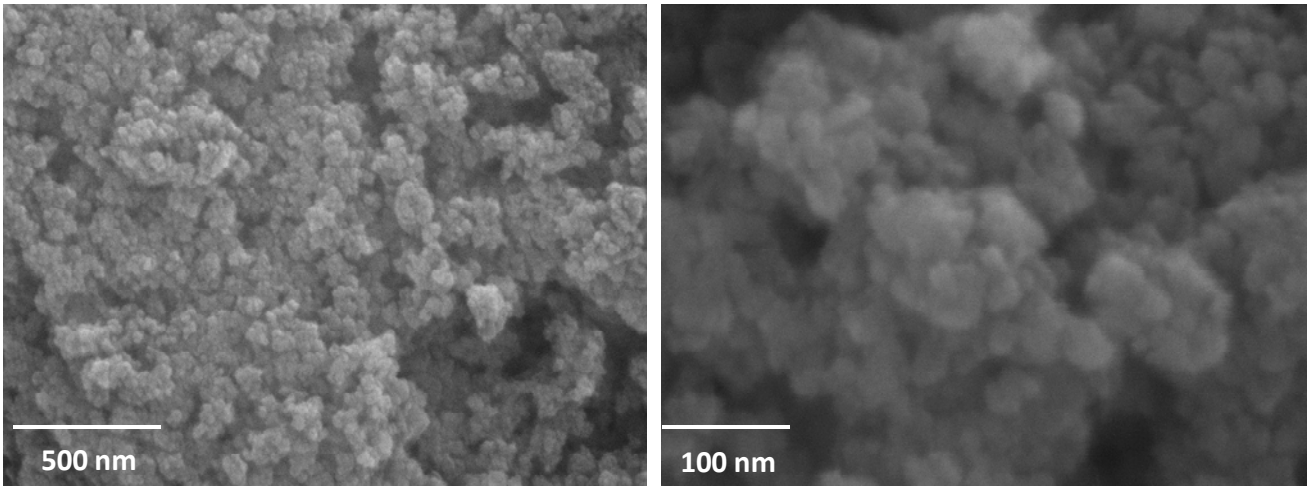

Figure S3. SEM images of Si-BEC (left) and Ti-BEC (right).

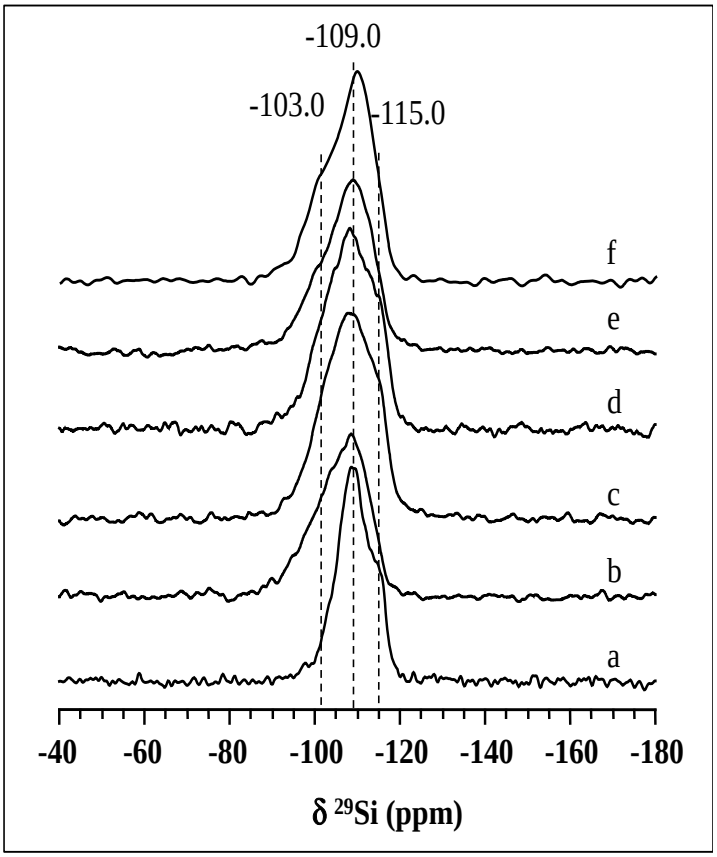

Figure S4. ^{29}Si MAS NMR spectra of (a) calcined and exposed to inert atmosphere BEC-type Ge-silicate, (b) calcined BEC-type Ge-silicate exposed to H_2O vapors, (c) Ti-BEC, (d) Ti,Si-BEC, (e) calcined Ti,Si-BEC and (f) calcined Si-BEC.

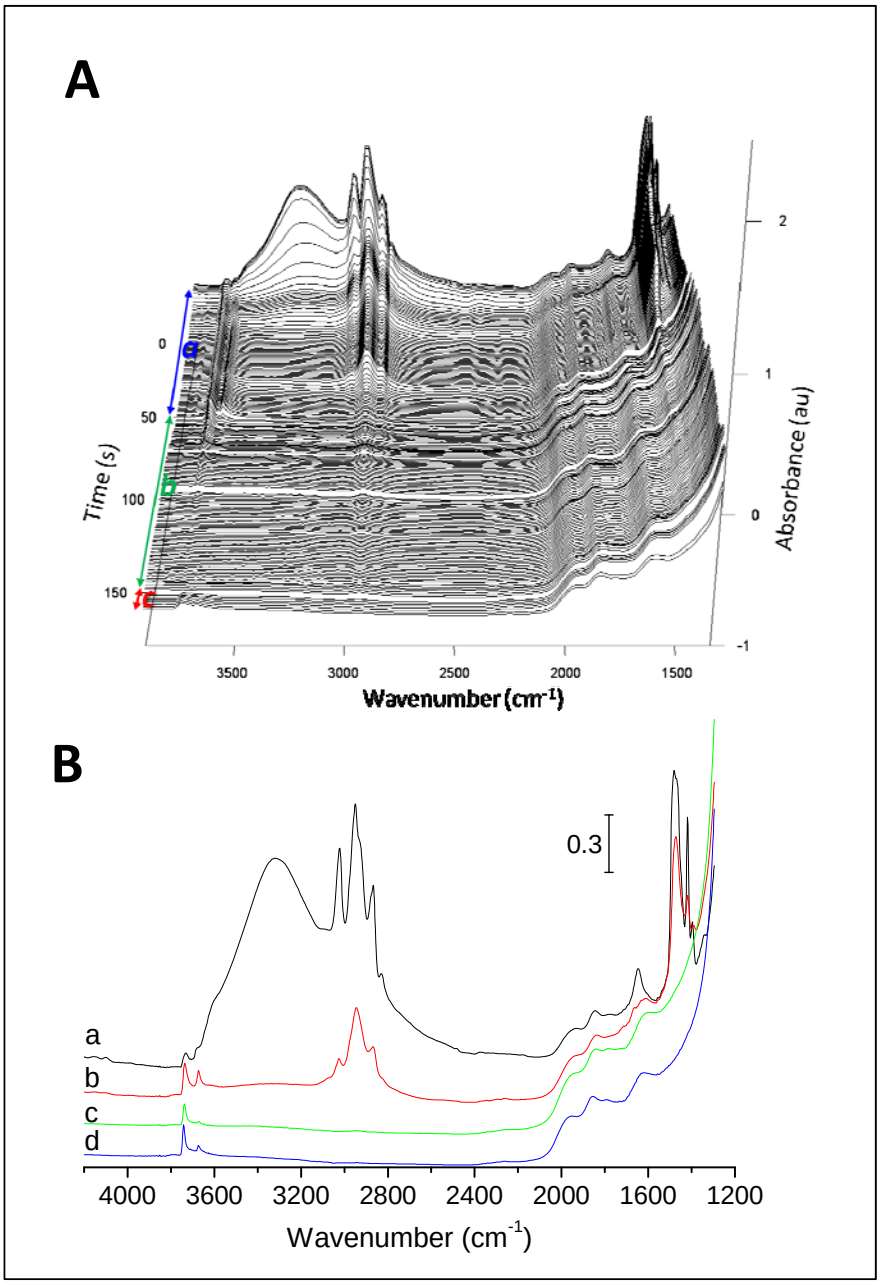

Figure S5. Post-synthesis modification of BEC-type material by method II: **(A)** Evolution of BEC-type material IR spectra *vs.* plasma treatment time during: O_2-plasma (a), $SiCl_4$-plasma (b) followed by O_2-plasma (c) treatment. **(B)** IR spectra of BEC-type material before treatment (a), after O_2-plasma (b), after O_2-plasma+$SiCl_4$-plasma (c) and after O_2-plasma+$SiCl_4$-plasma+O_2-plasma (d) treatments.

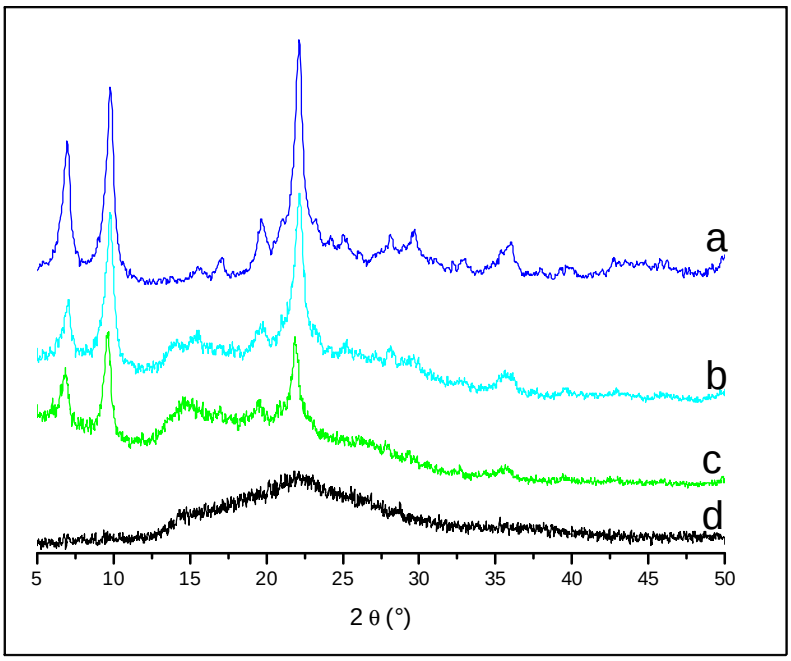

Figure S6. XRD patterns of: as-synthesized BEC-type Ge-silicate (a); calcined forms of Si-BEC (b) and Ti-BEC (c) obtained by method II; and calcined initial material exposed to water vapors (d).