**Fig. S1** Pore size distributions of cubic silica mesophases with *fcc* (a) or *bcc* (b) structures after conventional calcination at 550 °C (open circles) or the treatment with H$_2$SO$_4$ followed by calcination at 250 °C (solid circles). All PSD of these materials were calculated from their Ar physisorption isotherms measured at 87 K by using the NLDFT method.
**Fig. S2** TEM images of the cubic $bcc$ silica obtained after $H_2SO_4$ treatment and subsequent calcination at 250 °C viewed along [111] axis.

**Fig. S3** Nitrogen physisorption isotherm of cubic silica mesophase with $bcc$ structure after ethanol extraction.
**Fig. S4** Nitrogen physisorption isotherm of cubic silica mesophase with *bcc* structure after microwave digestion in a solution of H$_2$O$_2$/HNO$_3$ at 150°C. For the microwave digestion, 0.5 g of the as-synthesized powder is placed in a teflon liner where a mixture of 4 ml HNO$_3$ (15 M, 65%) and 2 ml H$_2$O$_2$ (30%) is then added. The mixture is then exposed 15 minutes to microwave irradiation at 150°C using a CEM Mars microwave apparatus.