Electronic Supplementary Material (ESI) for Soft Matter.

Electronic Supplementary Information for "Anomalous long-range repulsion between silica surfaces induced by density fluctuations in supercritical ethanol" by S. Mukai, T. Koyama, K. Tsujii and S. Deguchi.

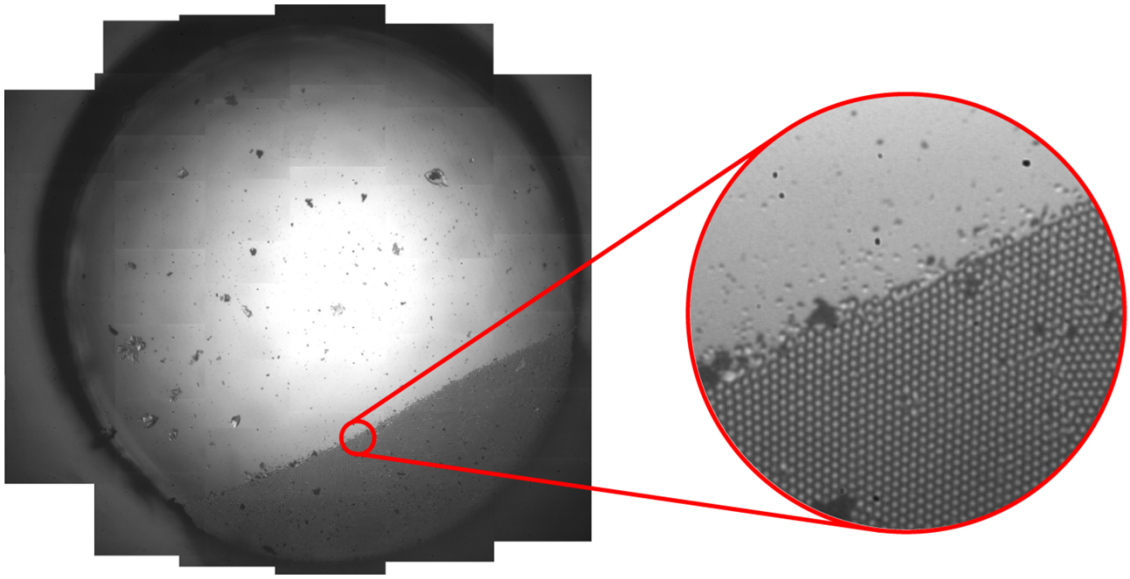

Fig. S1. Panorama microscopic image showing a 2D array of silica particles (d = 5.0 μm) formed at the periphery of a circular diamond window (1.5 mm in diameter).

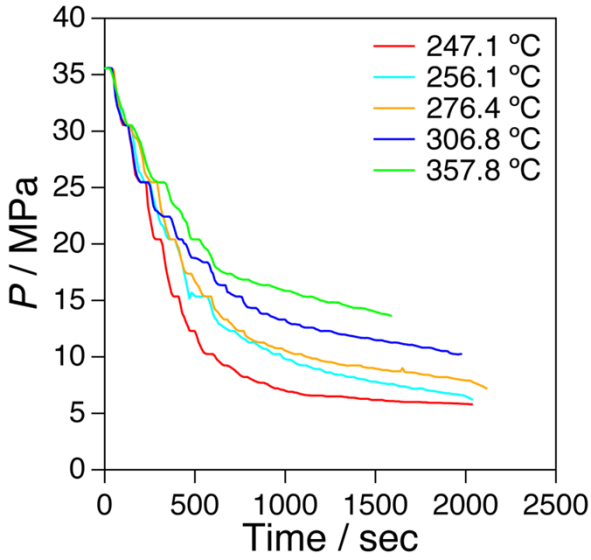

Fig. S2. Typical pressure profiles during experimental runs. Calculated decompression rates were 0.03 – 0.05 MPa/sec for the initial stages where d_s did not depend very much on the pressure, and 0.001 – 0.004 MPa/sec for the late stages where d_s depended keenly on the pressure.

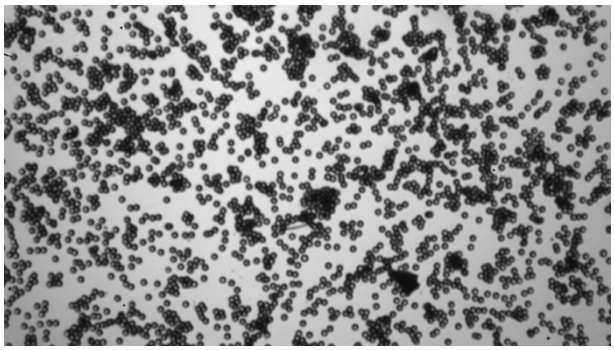

Fig. S3. Optical microscopic image showing agglomerates of the silica particles (d = 5.0 μm) in supercritical ethanol containing 2×10^{-3} M of $NaNO_3$ (T = 276.4 ºC, P = 35 MPa).

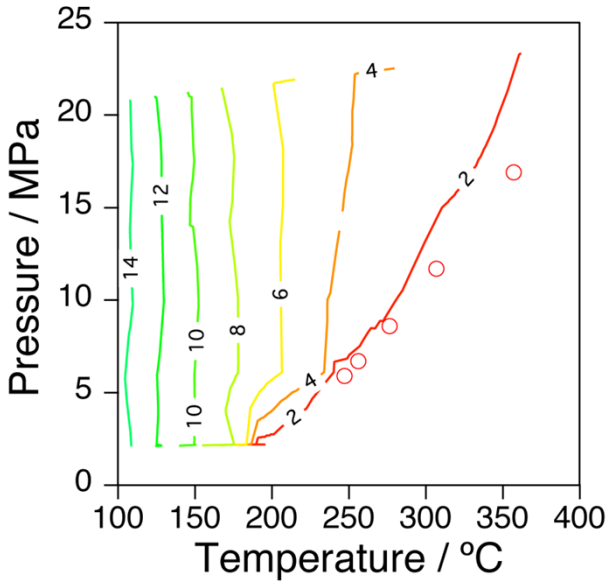

Fig. S4. Contour map of the dielectric constant of ethanol at high temperature and high pressure. Open red circles represent sets of temperature and pressure where the largest d_s values were observed. The map was constructed using data reported in ref. 1.

Movie captions

Movie S1. An image sequence showing structural change of a two-dimensional array made of monodisperse silica particles (d = 5.0 μm) in supercritical ethanol during isothermal decompression at 306.8 ºC. The sequence was composed of still images taken every 10 seconds during decompression from 35.6 MPa to 10.2 MPa (blue curve in Fig. S2).

References

1. Y. Hiejima and M. Yao, *J. Chem. Phys.*, 2003, **119**, 7931-7942.