Supporting Information

Molecular dynamics simulation and experimental verification of the effects of vinyl silicone oil viscosity on the mechanical properties of silicone rubber foam

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Experimental section

Cellular Structure

We placed the foam samples in liquid nitrogen for approximately 30 min to freeze and fracture, and then obtained the fractured surface sample. The fractured surfaces of the foamed samples were coated with gold. Under an accelerated voltage of 5 kV, the cellular structure was observed through a ZEISS GeminiSEM 500 (Obekochen, Germany) scanning electron microscope (SEM). Cell diameter was measured using Image-Pro Plus 6.0. The sum of all cell diameters was divided by the number of cells (at least 100 cells) in the SEM images to determine the average cell size (Φ). The cell den-sity (N_f) of foamed samples was determined as follows [1, 2]:

$$N_f = \left(\frac{nM^2}{A} \right)^{3/2} \tag{1}$$

where N_f is the cell density, n is the number of cells, M is the magnification, and A is the area of microscopic image (cm^2), which was calculated using Image-Pro Plus 6.0 soft-ware.

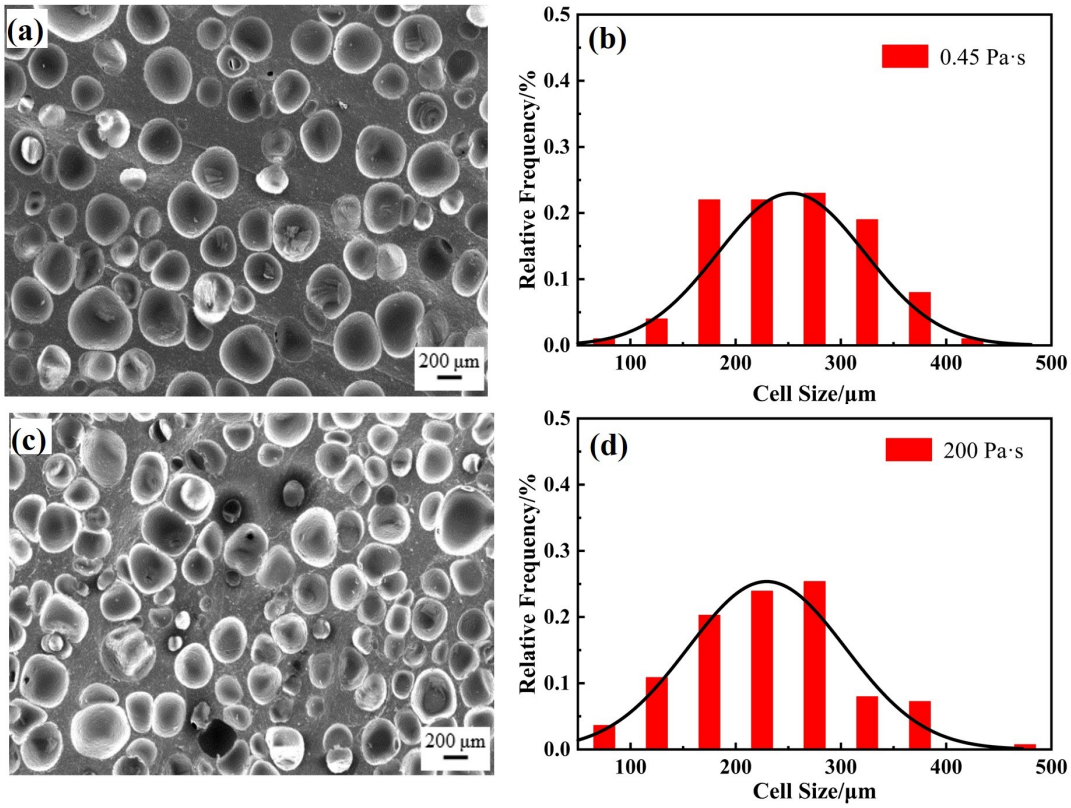

Fig. S1. Effect of crosslinking agent content on cellular structure and cell distribution of silicone rubber foam

Table S1. Effect of vinyl silicone oil viscosity on the cellular structure of the SRF.

Cellular Structures	0.45 Pa·s	200 Pa·s
Cell average size (μm)	253	229
Cell density (cells/cm^3)	1.55×10^9	2.52×10^9
Foaming density (g/cm^3)	0.658	0.515
Porosity (%)	54	64

References

[1] Y.L. Jia, B. Xiang, W.H. Zhang, T. Liu, S.K. Luo. Microstructure and properties of microcellular silicone rubber foams with improved surface quality. Polymer. Journal, 52(2019)207–216.

[2] W.Y. Tang, X. Liao, Y. Zhang, J.S. Li, G. Wang, G.X. Li. Mechanical-microstructure relationship and cellular failure mech-anism of silicone rubber foam by the cell microstructure designed in supercritical CO2. Journal of Physical Chemistry C, 123(2019)26947–26956.