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Supporting Information for

Fabrication of mesoporous organosilica in shallow trench for low-k and high elastic modulus material application

Hyuntaek Oh,[a] Jae Hyun Kim*,[b] and Jyongsik Jang*[a]

[a] WCU program of Chemical Convergence for Energy and Environment (C2E2), School of Chemical and Biological Engineering, College of Engineering, Seoul National University, 599 Gwanak-ro, Gwanak-gu, Seoul 151-742, Korea

[b] Manufacturing Technology Team, Infra Technology Service Center, Device Business, Samsung Electronics, San #16 Banwol-Dong, Hwasung-City, Gyeonggi-Do,Korea E-mail: hawk_kim@samsung.com

Small angle X-ray scattering of each MOS

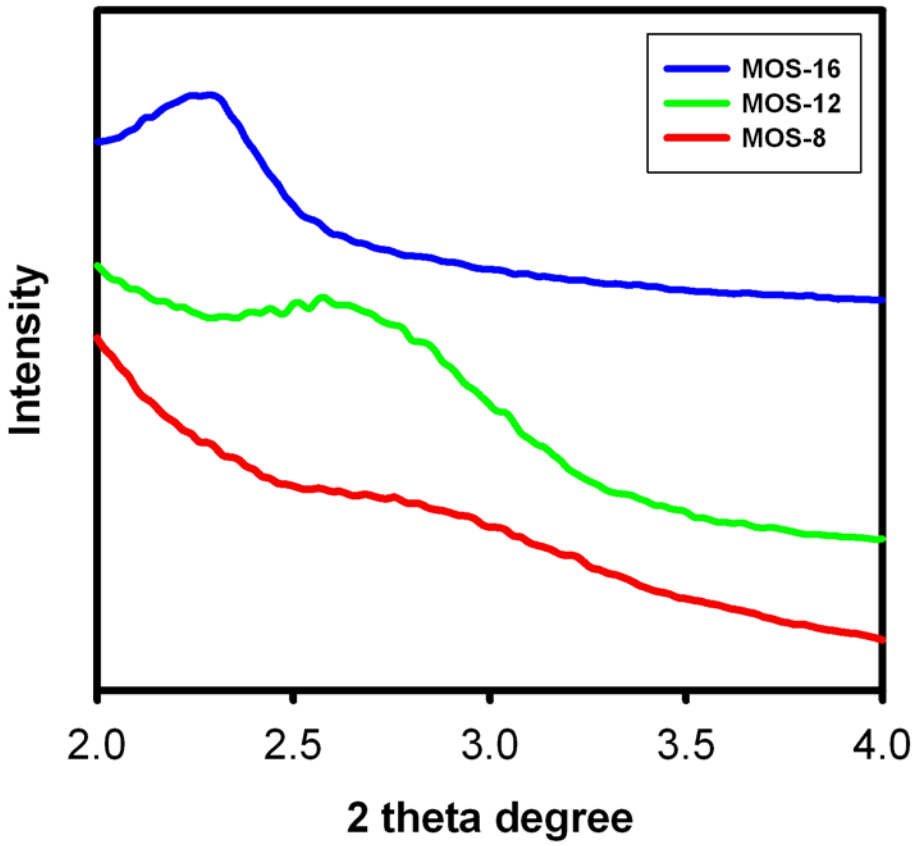

Figure S1. SAXS patterns of each MOS.

The SAXS patterns were deconvoluted to obtain the degree with maximum intensity. The 2Θ degree values of MOS-8, MOS-12, MOS-16 were 2.85, 2.59, 2.27, respectively. These values were used to calculate the d-spacing of each samples using Bragg equation.

MOS that were fabricated by sol - gel method

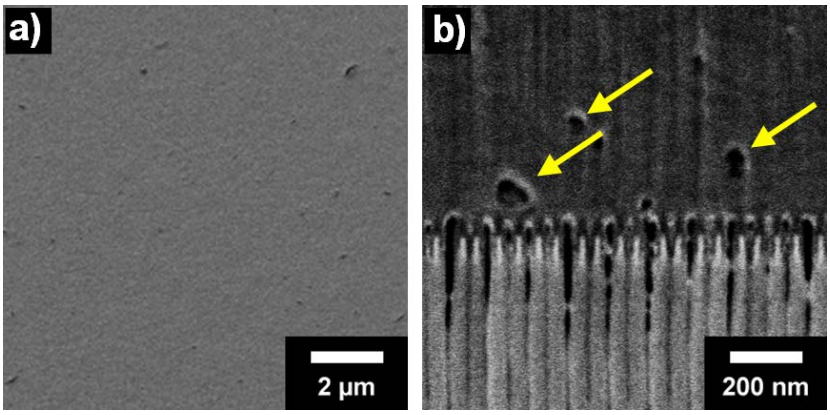

Figure S2. a) Surface and b) cross-sectional FE-SEM images of the MOS that were fabricated using sol-gel method

For control group, the sol-gel solution for soaking of pristine wafer was prepared by mixing of CTAB, HCl, distilled water, TEOS, and BTMSE (weight ratio = 1.37 : 0.1 : 9.2 : 3.3 : 0.33) with shaker for 10 min. After shaking, the solution became transparent and viscous solution. The pristine wafer was soaked into the solution for 5 min. Then the wafer was taken out from this solution and was spun up with 5000 rpm by spin coater for 30 s. The wafer was carried into a closed vessel at 70 °C for 12 h. After sol-gel reaction, the wafer was calcined at 500 °C in air for 5 h. Figure S2a displays surface FE-SEM image of the wafer prepared by sol-gel method. Judging from the surface image, no significant defects such as crack or thickness gradient were observed. This means that volume reduction of MOS did not affect at surface of MOS on the wafer during sol-gel reaction. However, profoundly the defects were observed (Figure S2b). Many voids existed in the trench of MOS, and the walls of wafer were collapsed. These defects were originated from the volume reduction of MOS in the trench during condensation reaction.