

Supporting Information

Very High Efficiency Porous Silica Layer Open-Tubular Capillary Columns Produced via in-Column Sol–Gel Processing

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Abstract

This supporting information provides some additional figures giving a more comprehensive interpretation of the contents of the main text.

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Figure S-1: Scanning electron micrograph of PLOT(10)-A, 10 μm i.d capillary with recipe A (5.0 mL TMOS). The measurement was carried out at 10 000-fold magnification. The scale bar corresponds to 500 nm.

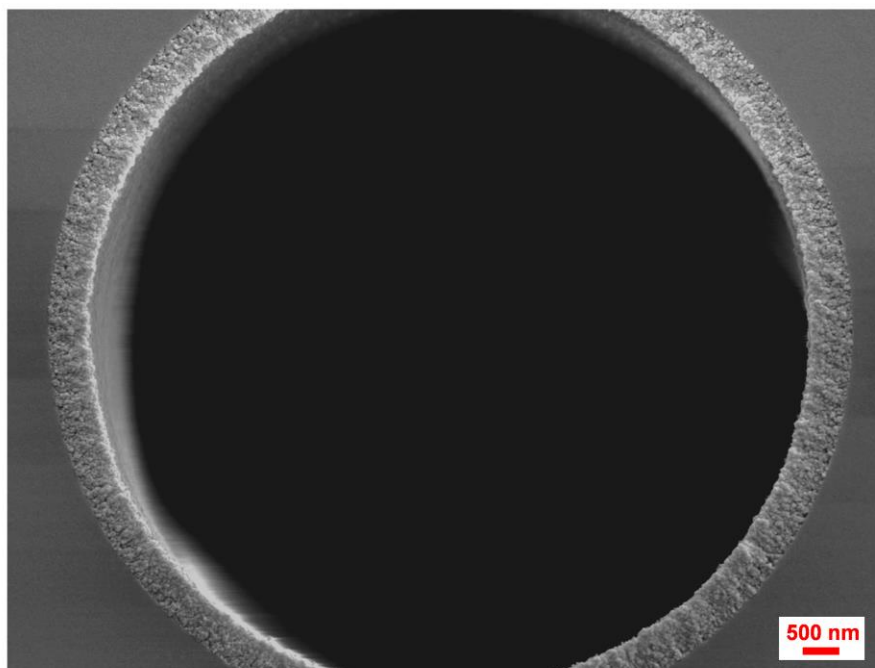


Figure S-2: Relationship between linear velocities and column pressure drop. Column: PLOT(5)-A (●), PLOT(5)-B (▲), and PLOT(5)-C (■). Solute: Coumarin 440 (C440). Mobile phase: 70:30% (v/v) methanol/water. Measurement temperature: 25 °C.

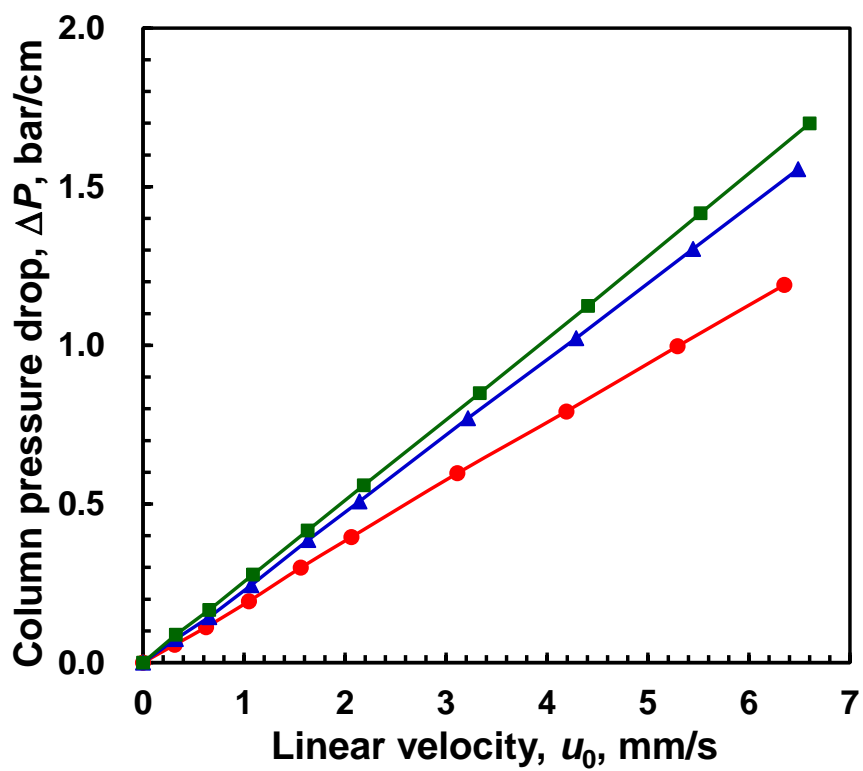


Figure S-3: Cumulative pore volume curves and mesopore size distributions determined for bulk-silica rods by argon physisorption. Sample: (a) Monolith rod-A, (b) Monolith rod-B, and (c) Monolith rod-C. All the bulk-silica rods were prepared according to the condition A, B, and C, as shown in Table 1. Half pore width (mode value), pore volume, and specific surface area are shown. Pore size distribution and cumulative pore volume were determined according to non-local density function theory (NLDFT) (cylindrical pores, NLDFT equilibrium model).⁴⁵⁻⁴⁷

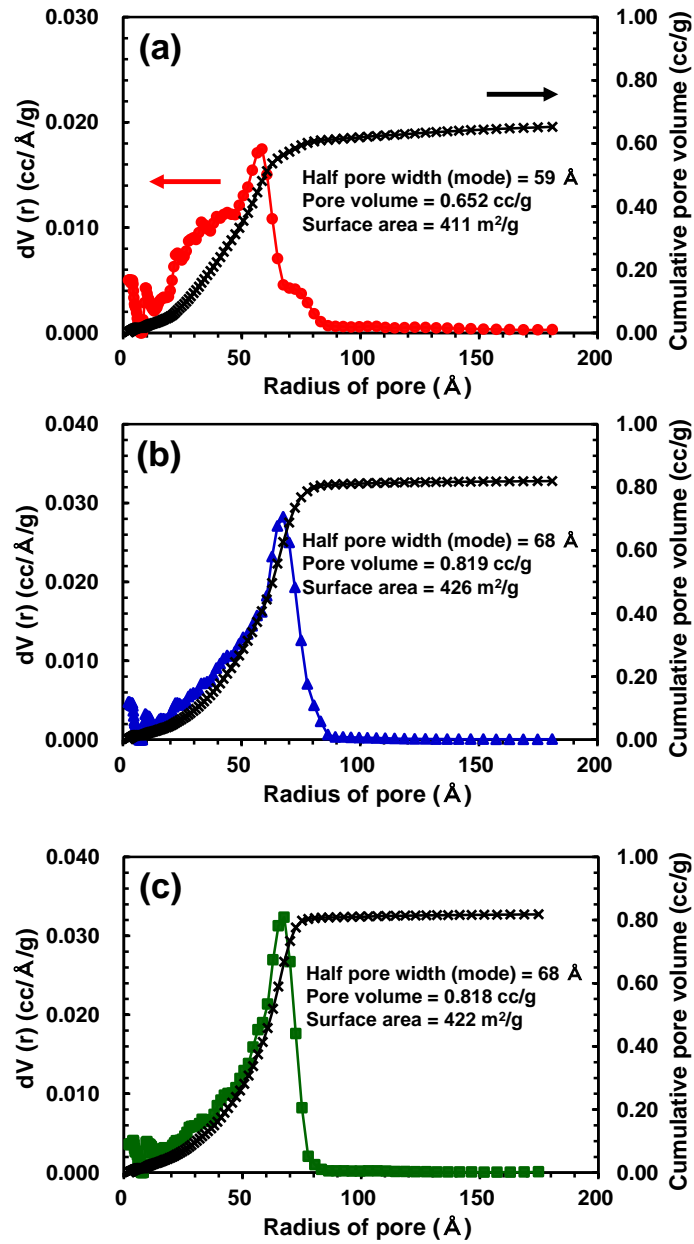


Figure S-4: Chromatograms obtained for coumarins C440, C460, and C480 with the ODS-modified PLOT capillary column. Column: PLOT(10)-A (effective length 56.0 cm, total length 62.9 cm). Mobile phase: 70:30% (v/v) methanol/water. Measurement temperature: 25 °C. Retention factor (k), theoretical plate number (N), and plate height (H) observed for coumarin 480 are indicated.

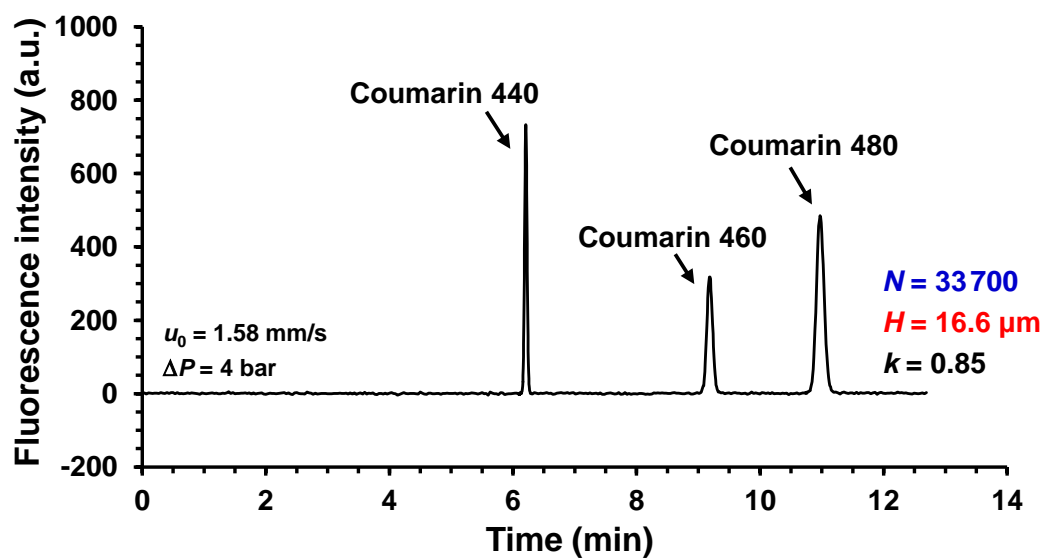
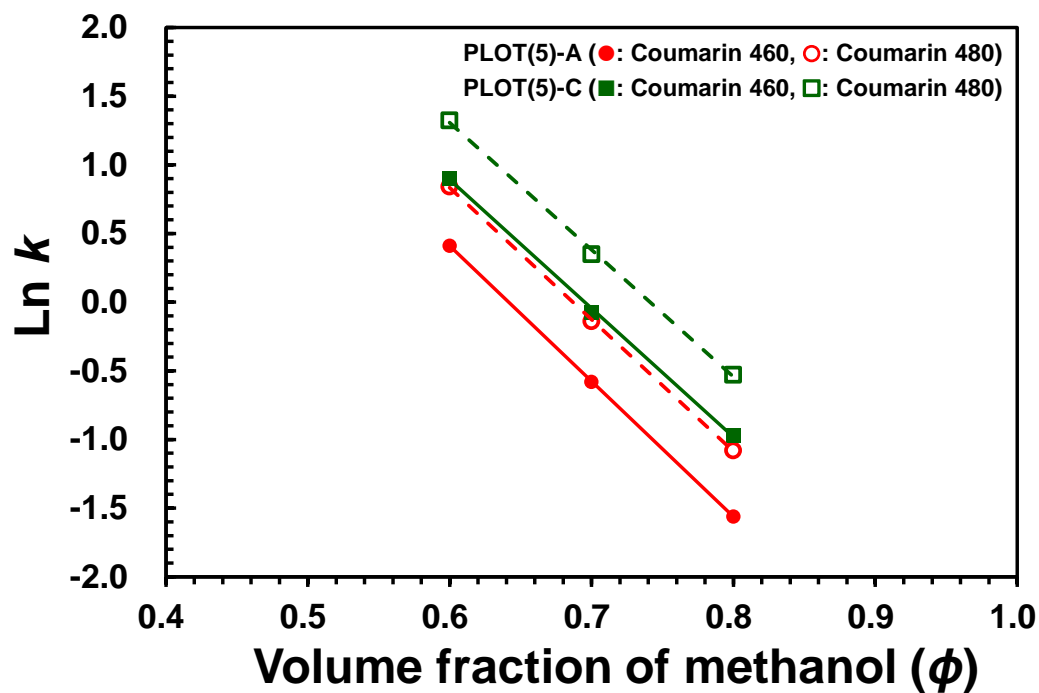


Figure S-5: Relationship between natural logarithms of retention factors and mobile phase compositions with ODS-modified PLOT capillary columns. Column: (a) PLOT(5)-A and (b) PLOT(5)-C. Solute: Coumarin 460 (C460) and coumarin 480 (C480). Measurement conditions are same as shown in Figure 3. Linear regression equations are given below.



PLOT-A (C460): $\ln k = -9.60\phi + 6.60$

PLOT-A (C480): $\ln k = -9.86\phi + 6.33$

PLOT-C (C460): $\ln k = -9.36\phi + 6.51$

PLOT-C (C480): $\ln k = -9.26\phi + 6.87$