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Supporting Information

Olefin Ring-closing Metathesis under Spatial Confinement: Morphology–Transport Relationships

Ulrich Tallarek,* Janika Hochstrasser, Felix Ziegler, Xiaohui Huang, Christian Kübel, and Michael R. Buchmeiser

Table S1. Dimensions of the final reconstructions ($x \times y \times z$ nm^3).

Crop	Si60	Si100
A	100 × 117 × 124	96 × 116 × 116
B	97 × 95 × 96	96 × 102 × 108
C	77 × 76 × 72	132 × 156 × 156
D	79 × 76 × 166	135 × 148 × 141

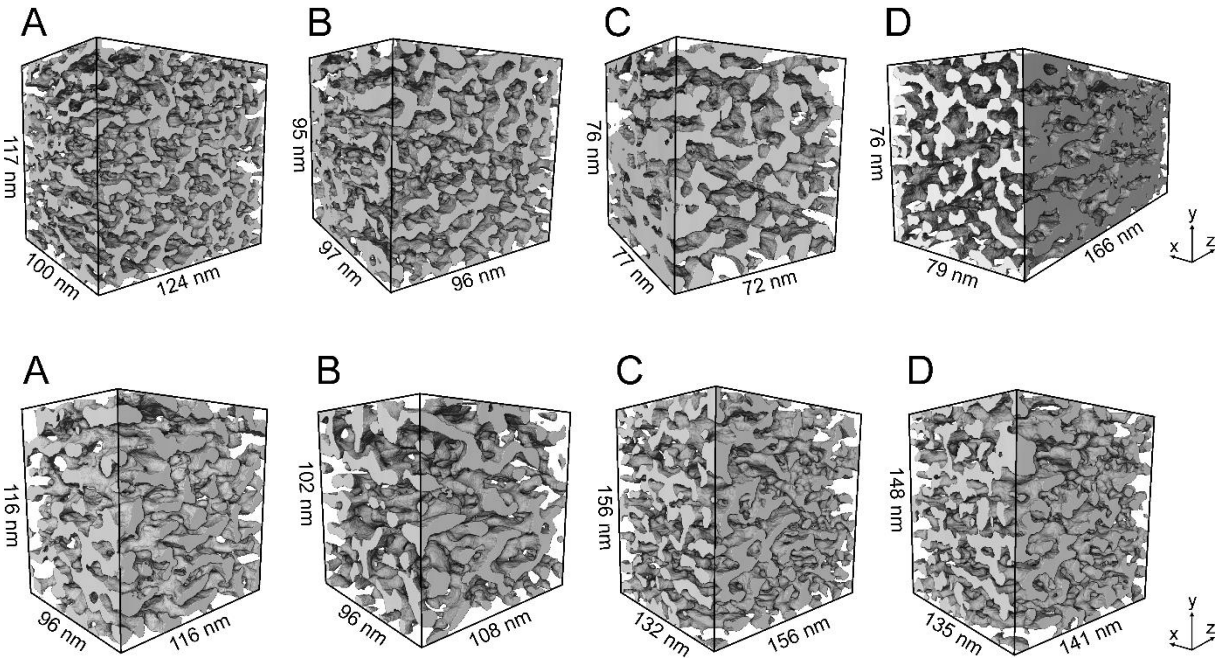

Figure S1. Cuboids from different regions of the Si60 sample (top row) and the Si100 sample (bottom row), which were used as final reconstructions for morphological analysis and the pore-scale simulations of hindered diffusion.

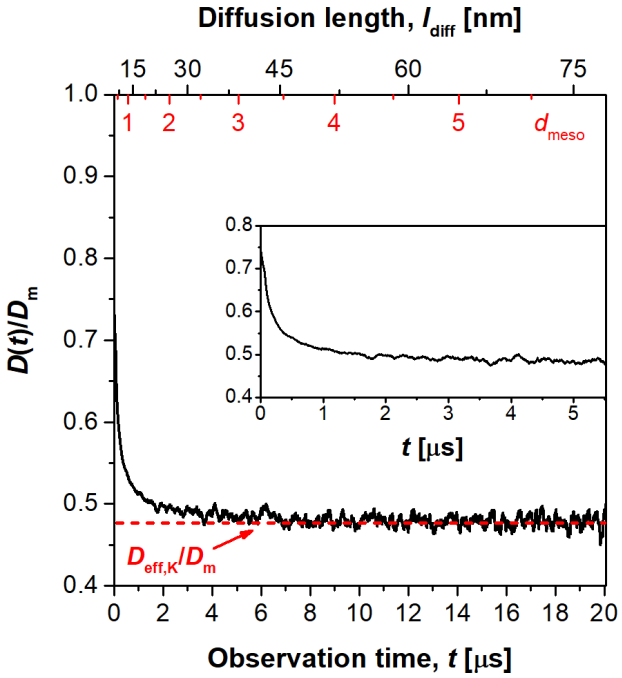

Figure S2. Transient diffusion coefficient $D(t)$ normalized by D_m, the diffusion coefficient for free diffusion in the bulk liquid, simulated for d_{tracer} = 2.56 nm in crop A of sample Si100 (cf. Figure S1). After a short diffusion time (<10 µs), the tracers have sampled the microstructural heterogeneity of the pore space and the normalized effective diffusion coefficient $D_{eff,K}/D_m$ is reached (dashed red line).

Figure S2 illustrates the simulation of $D_{eff,K}$ for d_{tracer} = 2.56 nm in one of the crops from sample Si100, assuming a tracer diffusion coefficient in the bulk liquid of $D_m = 1.5 \times 10^{-10}$ m^2 s^{-1}. The figure reveals a steep decrease of $D(t)$ at the beginning of the simulation (see inset) due to initial contact of the tracers with the impenetrable walls. However, within less than ten microseconds, the tracers have experienced the microstructural heterogeneity of the pore space and asymptotic behavior is observed.

The diffusion time required to reach the asymptotic behavior translates into a diffusion length $l_{diff} = (2D_m t)^{0.5}$ of a few tens of nanometers or 3–4 pore diameters (d_{meso}), also indicated in the figure. This diffusion length reflects a pore space characterized by a short-ranged heterogeneity, which is quickly sampled by the tracers to attain quasi-homogeneous behavior and document effective diffusion properties. The asymptotic $D(t)$-value corresponds to $D_{eff,K}$.