Electronic Supplementary Information for:

Exciton migration dynamics between phenylene moieties in the framework of periodic mesoporous organosilica powder

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1. Estimation of the 210-nm pulse intensity

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The excitation light intensity at 210 nm was estimated from a difference of the intensity of 420 nm before and after conversion because of its difficulty of direct measurements. The output power of 420 nm was measured by varying the phase matching angle of a BBO crystal and the difference between maximum and minimum output powers was obtained as the converted power to 210 nm. In the case of maximum intensity, the difference was 0.6±0.1 μJ pulse^{-1} at 420 nm, which corresponds to the photon number at 210 nm to be 6×10^{11} photon pulse^{-1}. Since the sum of the transmittance of all optics used for deriving the 210-nm light to the sample, a 0.3-mm BBO crystal, two beam splitters, a silver mirror, a depolarizer, and a lens, is estimated to be approximately 70% at 210 nm, the excitation light intensity decreased by 0.4±0.1μJ pulse^{-1} at the sample. The excitation light intensities decreasing with ND filter were estimated by measuring the ratio of the fluorescence intensity of the standard sample. The excitation light intensity per unit area is calculated to be 0.2±0.1 mJ pulse^{-1} cm^{-2} for the strongest power, indicating that the ±50% error is included in the measurements.

Figure S1 shows the density distribution of the excited Ph moieties in Ph-PMO when Ph-PMO is excited by 210 nm light. The absorption coefficient (ε) of a precursor phenylene silica monomer (1,4-bis(triethoxysilyl)- benzene, BTEB) in cyclohexane at 210 nm (9300 M^{-1} cm^{-1}), was used as the absorption coefficient of Ph-PMO at 210 nm (Figure S2). From this simulation, the half of Ph moieties at the surface is excited by excitation light intensity of $1\text{x}10^{16}$ photon cm^{-2}. The absorption is saturated by more than excitation light intensity $1\text{x}10^{17}$ photon cm^{-2}. Therefore, excitation light intensities in this study ($5\text{x}10^{11}$, $5\text{x}10^{12}$, $4\text{x}10^{13}$, and $2\text{x}10^{14}$ photon cm^{-2}) are weak enough to induce the saturation effect.

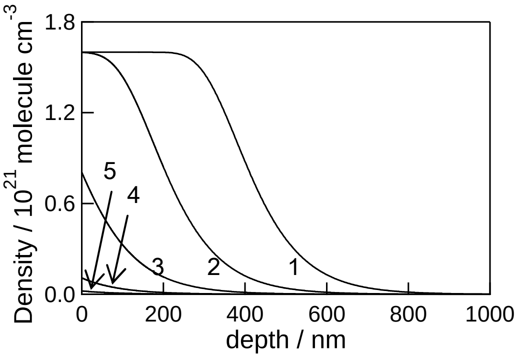

Figure S1. The density of the excited Ph moieties of Ph-PMO in depth when the Ph-PMO was excited by (1) $1x10^{18}$, (2) $1x10^{17}$, (3) $1x10^{16}$, (4) $1x10^{15}$, (5) $2x10^{14}$ photon cm^{-2} at 210 nm.

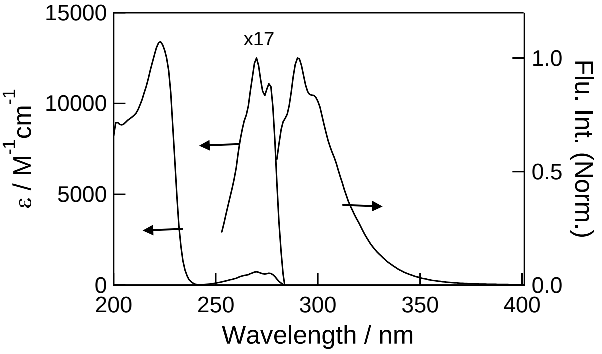

Figure S2. Absorption and fluorescence spectra of BTEB in MeOH/EtOH at room temperature ($\lambda_{Ex.}$ = 266 nm for fluorescence spectrum).