

Supporting information

New insights into the mesophase transformation of ethane-bridged PMOs by the influence of different counterions under basic conditions

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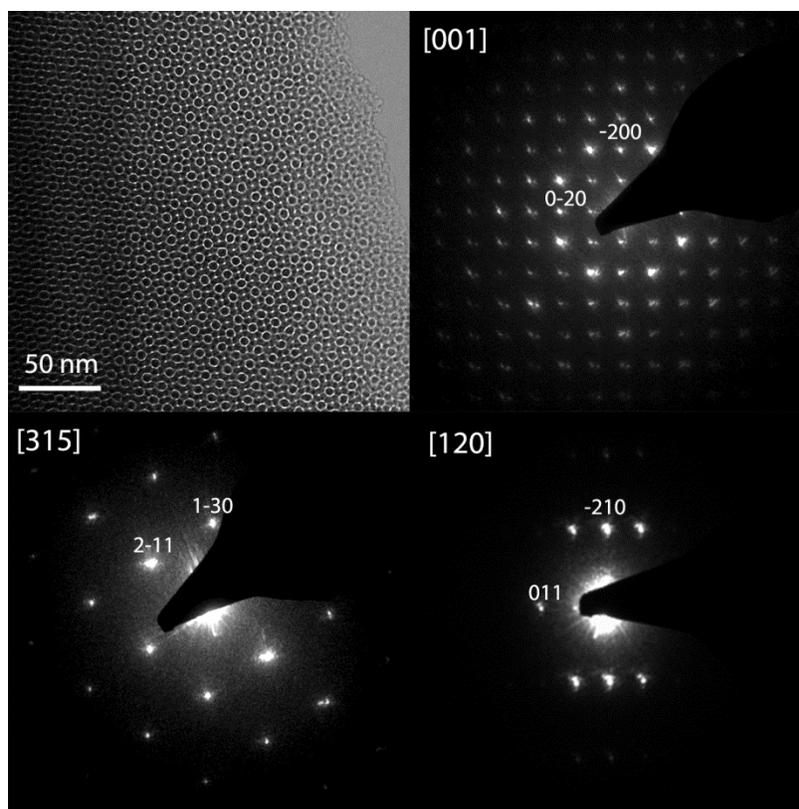


Figure S1. PMO synthesized with CTACl (cubic structure, $Pm\bar{3}n$): HRTEM image acquired along the [001] direction and different diffraction patterns acquired along the indicated zone axes

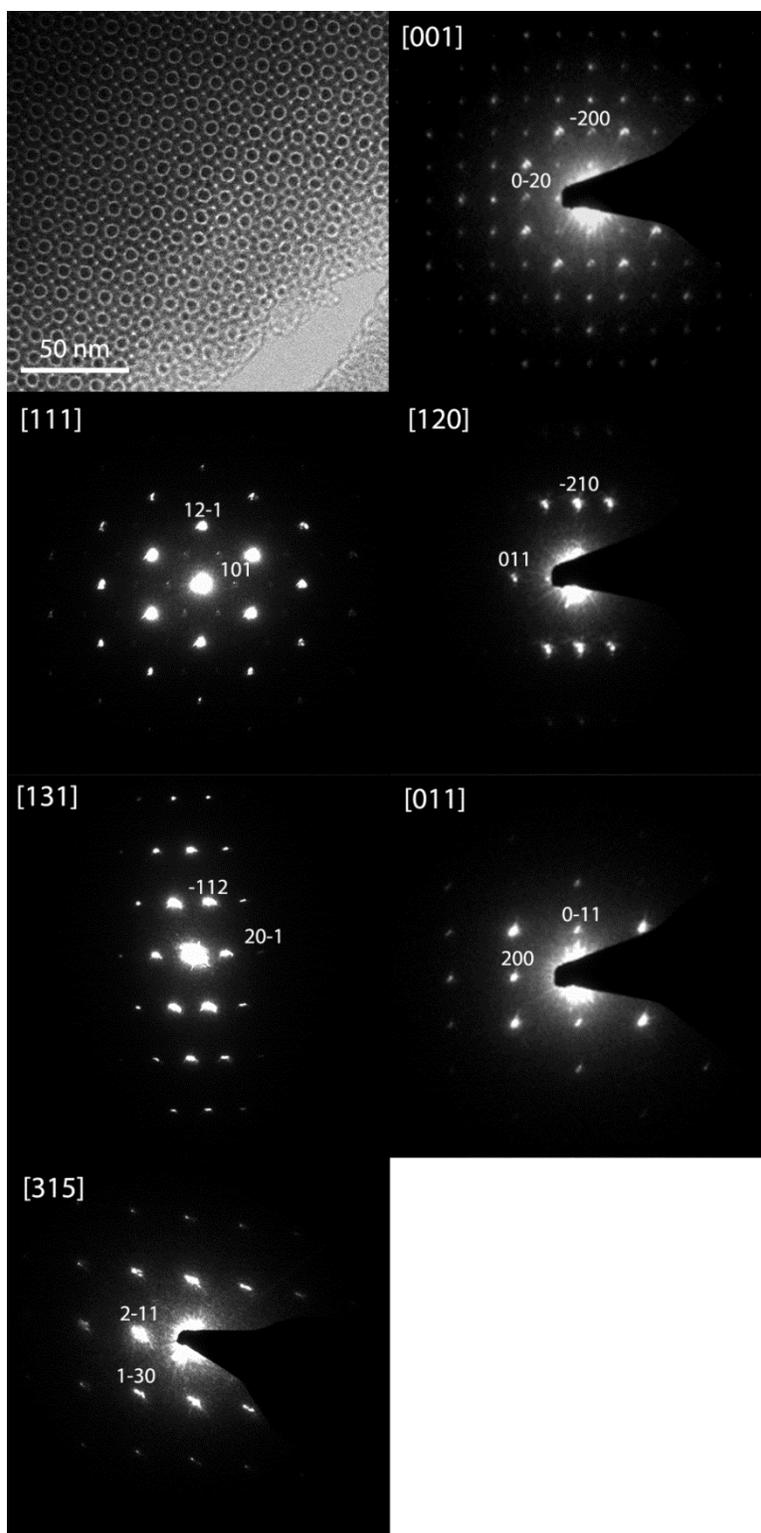


Figure S2. PMO synthesized with $\text{CTA}(\text{SO}_4)_{1/2}$, (cubic structure, $Pm\bar{3}n$): HRTEM image acquired along the [001] direction and different diffraction patterns acquired along the indicated zone axes

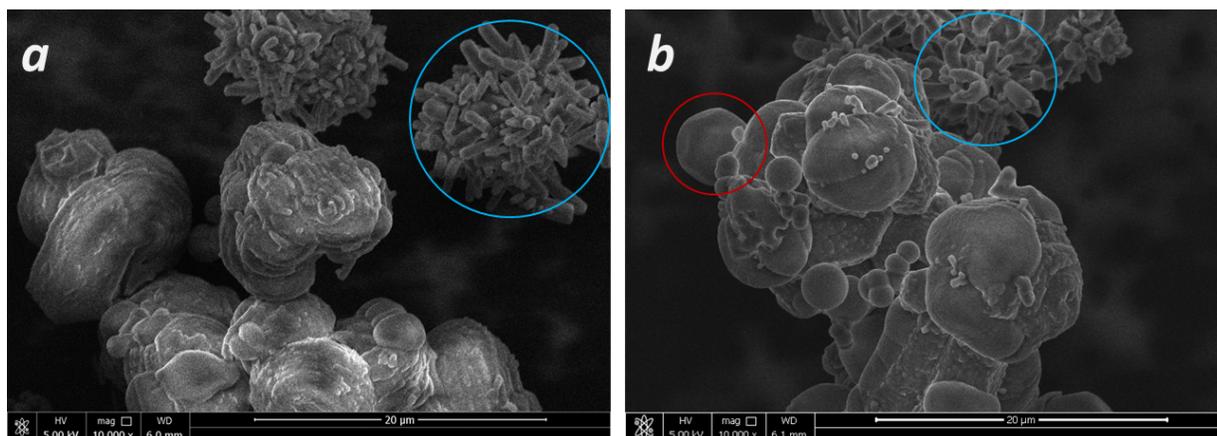


Figure S3. SEM images of ethane-bridged PMOs synthesized with a surfactant mixture CTABr/CTACl with different molar ratios: (a) CTACl:CTABr=4:6 and (b) CTACl:CTABr=6:4 (The blue circles point out the particles with 2-D hexagonal $p6mm$ mesophase, while the red circle point out the particles with cubic $Pm3n$ mesophase)

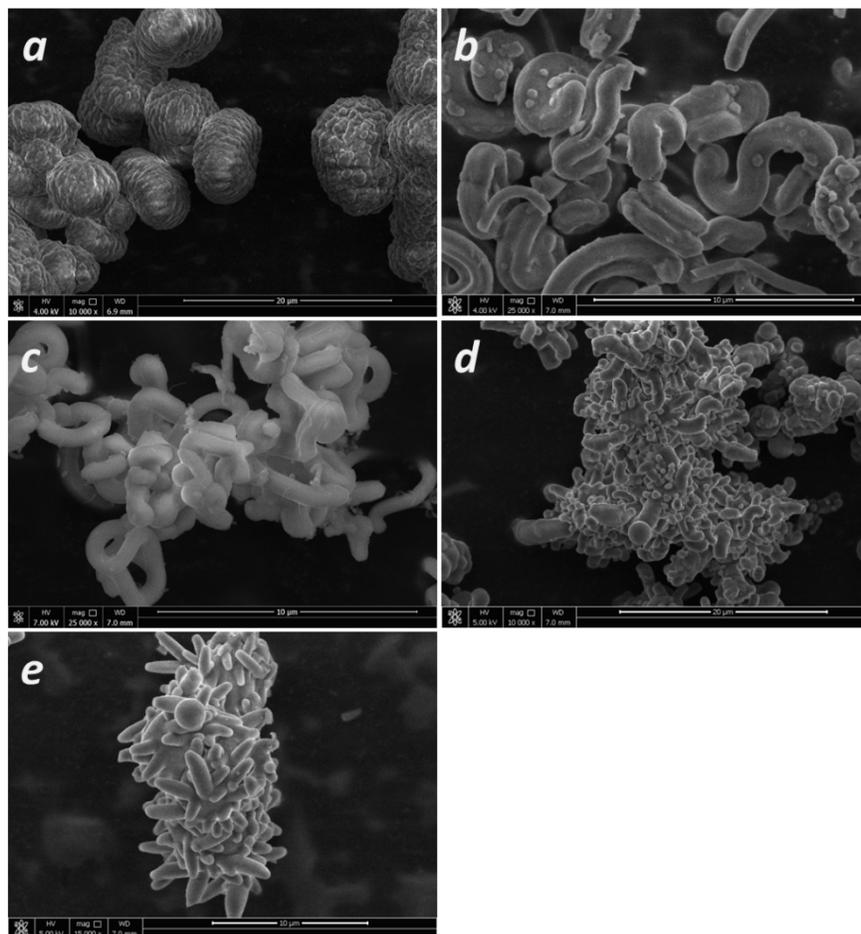


Figure S4. SEM images of the ethane-bridged PMOs synthesized with the assistance of different sodium salts in the presence of CTACl or CTABr as surfactant: (a) CTACl + NaNO₃, (b) CTABr + NaSCN, (c) CTACl + NaSCN, (d) CTACl + NaCl, and (e) CTABr + NaCl

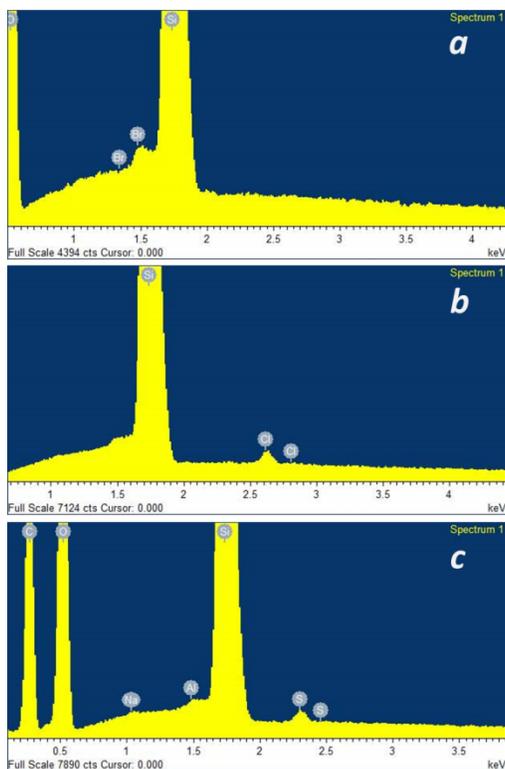


Figure S5 EDX analysis of the as-synthesized ethane-bridged PMO materials prepared with different surfactant: (a) CTABr, (b) CTACl, and (c) CTA(SO₄)_{1/2}

Table S1 The content of the counterions in as-synthesized ethane-bridged PMO materials

| Weight | PMO-CTABr | PMO-CTACl | PMO-CTA(SO ₄) _{1/2} |
|-------------|-----------|-----------|--|
| X (Br/Cl/S) | 0.53% | 1.10% | 1.10% |