

## IL@PZS Nanocomposites as Catalysts for CO<sub>2</sub> Conversion

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Cyclomatrix polyphosphazenes (PZS) can be readily synthesized through precipitation polymerization,<sup>[1]</sup> and serves as a host of nanocomposites due to their large pores and electron-rich environment.<sup>[2]</sup> Ionic liquids (ILs) are composed of ion pairs of which the anion catalyzes the cycloaddition reaction of carbon dioxide (CO<sub>2</sub>) with epoxides.<sup>[3]</sup> CO<sub>2</sub> is an abundant and renewable C1 building block for the synthesis of value-added carbonates/polycarbonates.<sup>[4]</sup> Herein, we developed IL and PZS nanocomposites (IL@PZS) and applied them for CO<sub>2</sub> conversion.

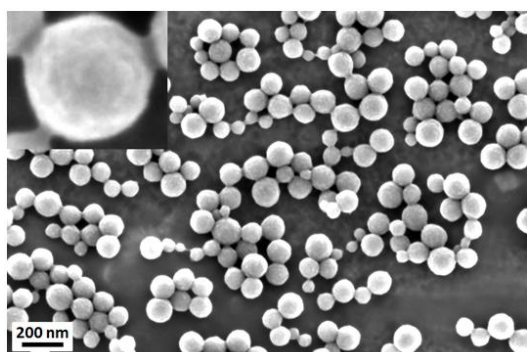


Figure 1. SEM of PZS nanospheres.

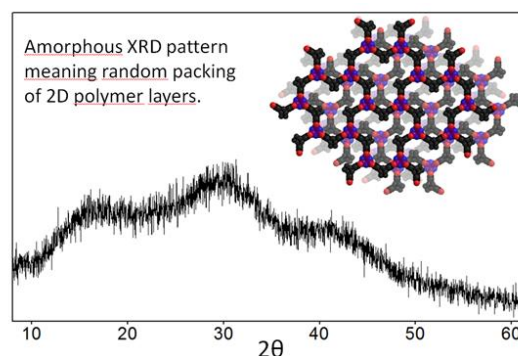


Figure 2. Powder X-ray diffraction of PZS nanospheres.

The yields of styrene carbonate are dramatically increased compared to that using only ILs as catalysts. The catalytic activity of the IL@PZS nanocomposites depends on structure matchability between the ILs and the PZS.

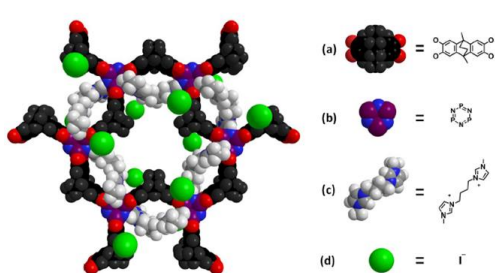


Figure 3. A typical IL@PZS nanocomposite.

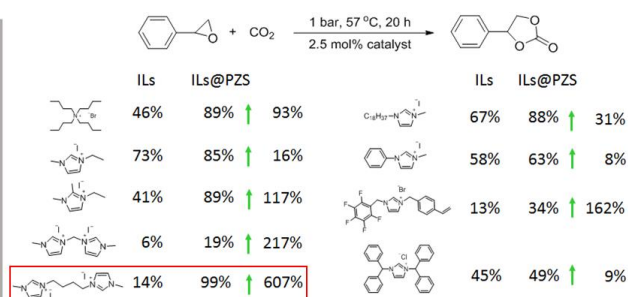


Figure 4. Catalysis comparison for CO<sub>2</sub> conversion.

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[3] Sun Q., Aguila, B., Perman J., Nguyen N., Ma S., J. Am. Chem. Soc., **2016**, 138, 15790.

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