Supplementary Information

Chitosan Functionalized Ionic Liquid as a Green, Recyclable Biopolymer-Supported Catalyst for Cycloaddition of CO₂

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1. FT-IR

To ascertain the chemical immobilization of EMImX on CS, FT-IR spectroscopic studies were carried out using CS-EMImBr as an example. As seen in Fig.1S, EMImBr (spectra A) displays four typical peaks centered at 1067, 1171, 1573 and 1636 cm⁻¹ associated with stretching frequencies of the imidazolium ring, in which a typical strong peak centered at about 1570 cm⁻¹ corresponding to the stretching frequency of the functional group -C=N-. The characteristic peaks of aromatic band stretches at 2850-3130 cm⁻¹. There are two characteristic peaks of chitosan (spectra B) at 3455 and 1093 cm⁻¹. In contrast with the spectras of A and B, a characteristic peak of -CN stretching vibration centered at about 1595 cm⁻¹ in CS-EMImBr (spectra C) suggesting the covalent immobilization of EMImBr to CS.

Fig. 1S FT-IR spectra comparison of EMImBr (A), CS (B) and CS-EMImBr (C).
2. Scanning electron microscopy (SEM)

![Fig. 2S](image)

**Fig. 2S** Scanning electron microscopy images of CS (a) and CS-EMImBr (b).

3. Thermogravimetric analysis (TGA)

![Thermogravimetric curves](image)

**Fig. 3S** Thermogravimetric curves for CS, CS-EMImBr and four times recycled CS-EMImBr.