materials

MDPI

Supplementary Materials

A Novel POP-Ni Catalyst Derived from PBTP for Ambient Fixation of CO_2 into Cyclic Carbonates

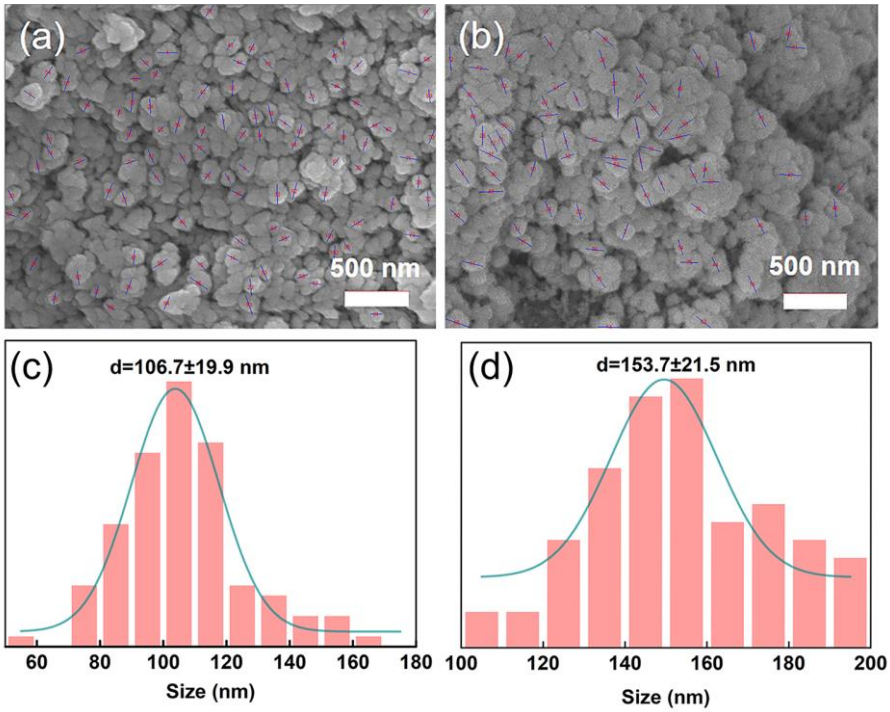


Figure S1. SEM image of PBTP (**a**) and POP-Ni (**b**); particle size distribution diagram of PBTP (**c**) and POP-Ni (**d**).

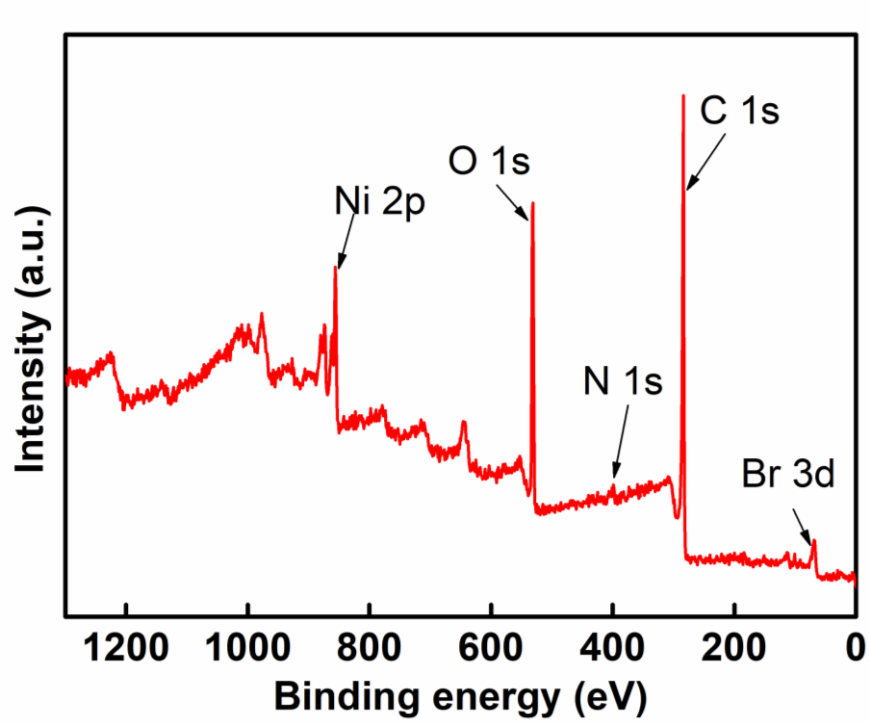
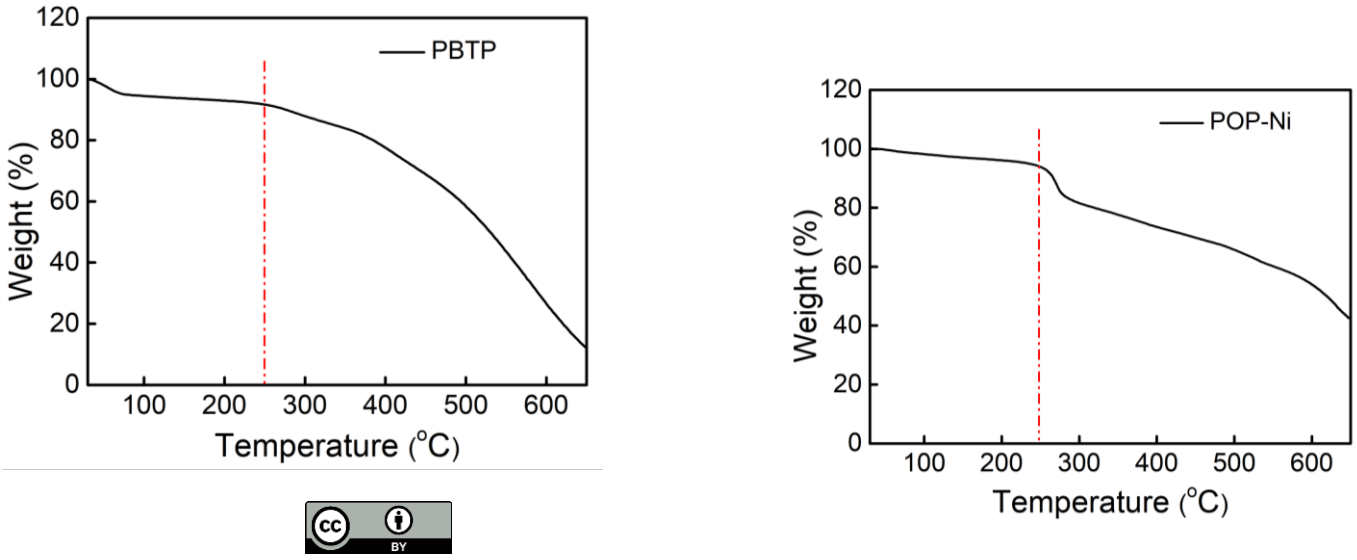


Figure S2. XPS spectrum of POP-Ni.



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(**a**) (**b**)

Figure S3. (a) TGA profile of PBTP; (b) TGA profile of POP-Ni.

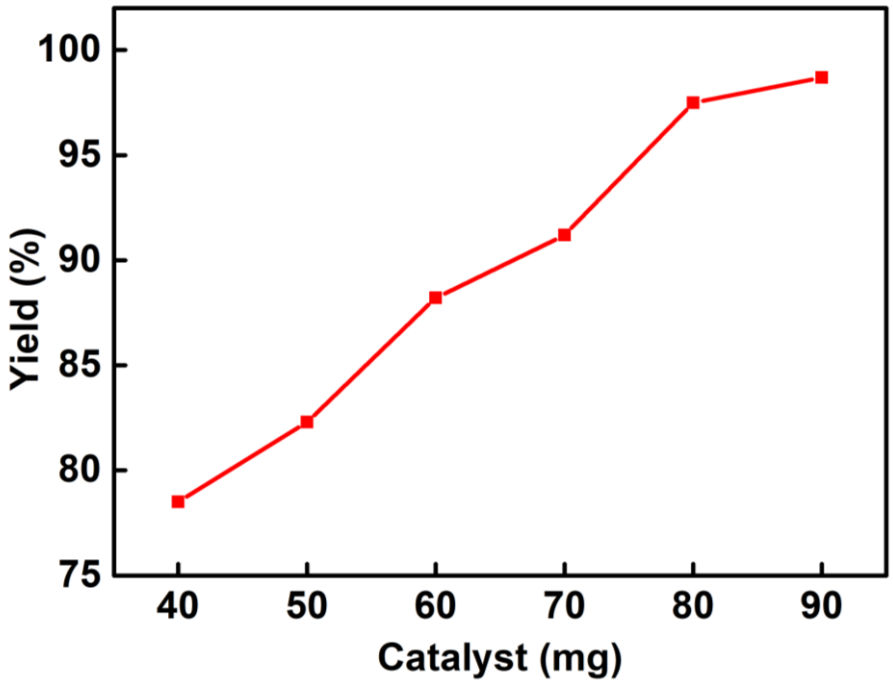
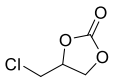
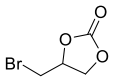
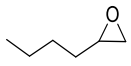
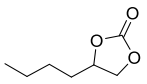
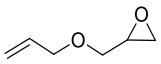
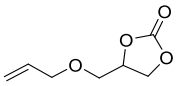
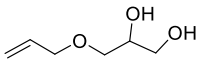
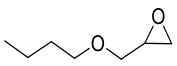
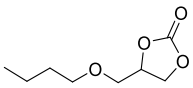
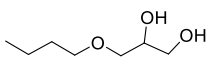
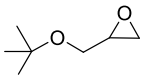
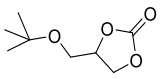
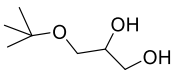
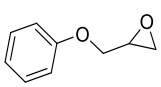
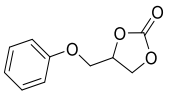
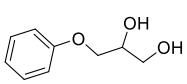
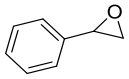
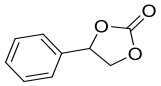
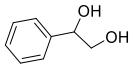


Figure S4. The catalytic activity corresponding to different catalyst amounts.

Table S1. Screening on the substrate scope for CO_2 cycloaddition with POP-Ni catalyst [a].

Entry	Epoxide	Product [b]	Major by-product [b]
1			——
2			——
3			——
4			
5			
6			
7			

8			

[a] Reaction condition：5 mmol of epoxide, 80 mg of POP-Ni, 0.5 mL of DMF, CO_2 (balloon), 80 °C and 24 h.
[b] Determined by GC-MS.

Table S2. Recyclability of catalyst POP-Ni.

Cycles	Yield (%)	Selectivity (%)
1	97.5	> 99
2	95.8	> 99
3	94.2	> 99
4	92.2	> 99
5	92.4	> 99
6	91.5	> 99

Reaction conditions**:** epichlorohydrin (5 mmol), POP-Ni (80 mg), 0.5 ml of DMF, CO_2 balloon, 24 h. The mixture was kept stirring at 80 °C for 24 h. Determined by GC-MS analysis of crude reaction samples.

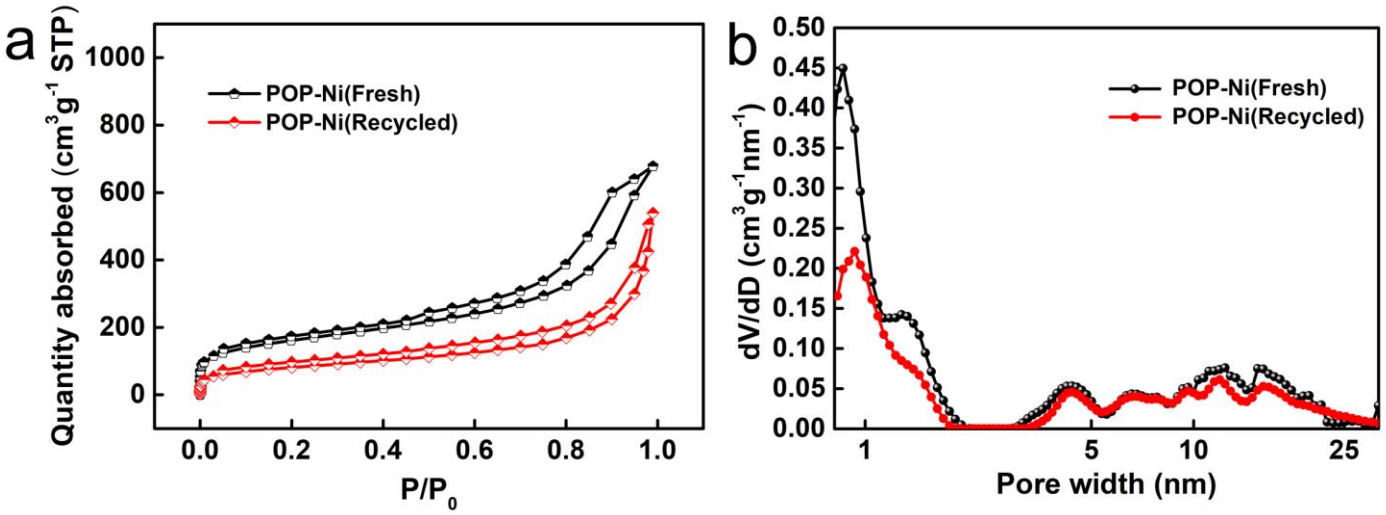


Figure S5. N_2 adsorption/desorption isotherm (a) and pore size distribution (b) of POP-Ni (fresh) and POP-Ni (recycled catalyst after the fourth run).

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