

## **Electronic Supplementary Information (ESI)**

### **Green and moderate route for the utilization of CO<sub>2</sub> - Microwave induced copolymerization with cyclohexene oxide using highly efficient double metal cyanide complex catalysts based on Zn<sub>3</sub>[Co(CN)<sub>6</sub>]**

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## 1. Characterization of DMC complexes.

### 1.1. Elemental composition of DMC complexes.

Table S1. Elemental composition of DMC complexes

Sample	%C	%H	%N	%Zn	%Co
DMC-1	23.46	3.911	13.83	29.76	3.61
DMC-2	24.10	4.359	14.06	19.32	0.9622
DMC-3	30.88	4.483	12.15	15.58	0.6760
DMC-4	23.07	4.435	13.52	12.09	0.7154
DMC-5	22.34	4.303	15.33	18.31	7.92

Obtained from elemental analysis and ICP-OES analyses.

## 1.2. XPS spectra of DMC complexes.

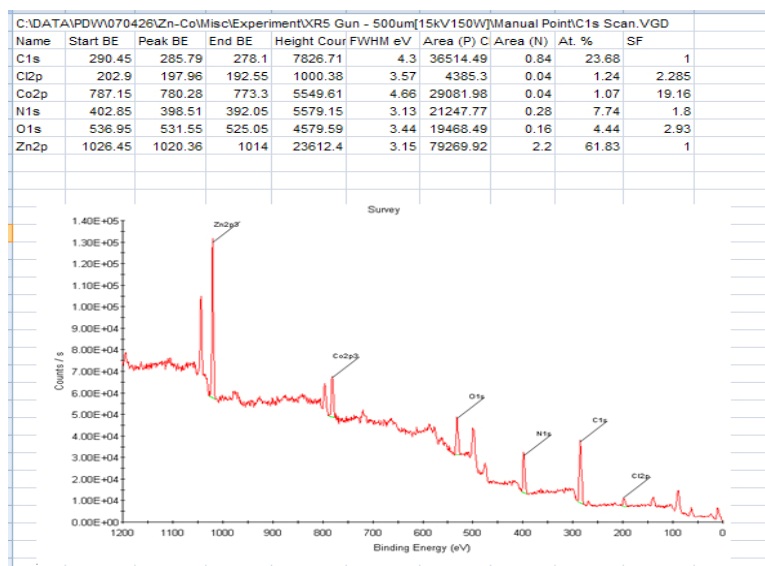


Fig. S1. XPS data of DMC-1 catalyst

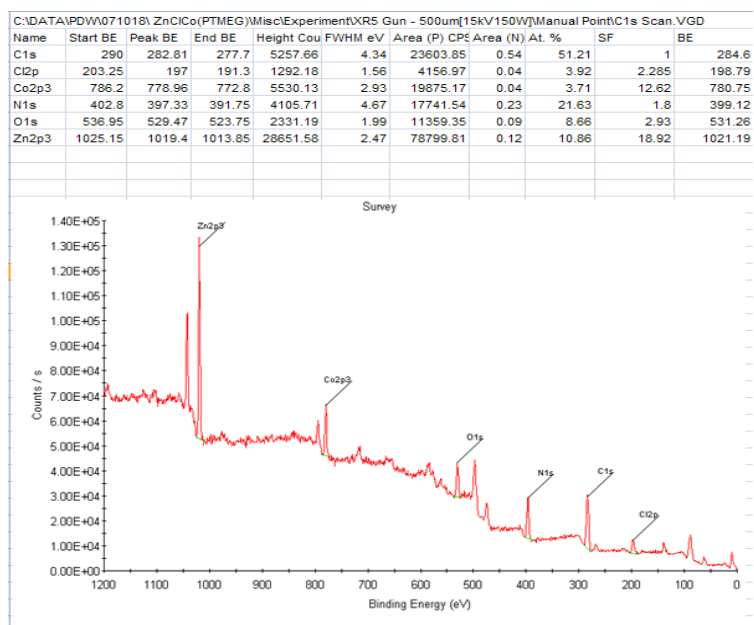


Fig. S2. XPS data of DMC-2 catalyst

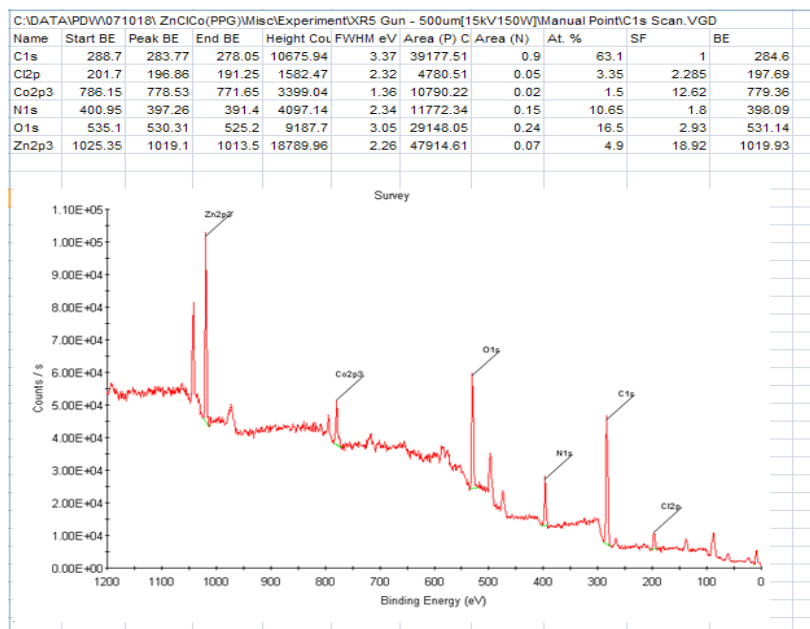


Fig. S3. XPS data of DMC-3 catalyst

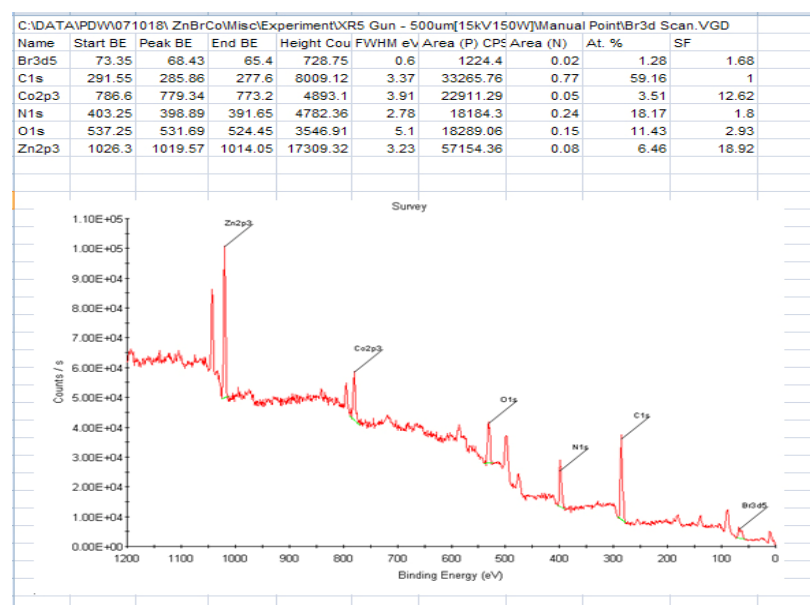


Fig. S4. XPS data of DMC-4 catalyst

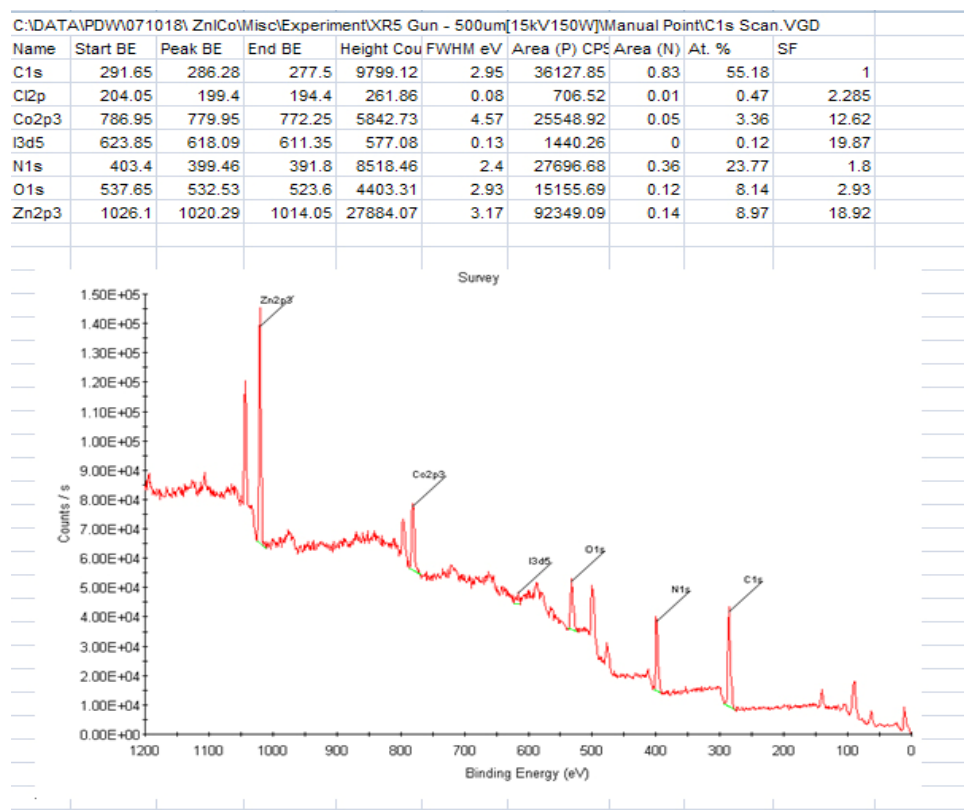


Fig. S5. XPS data of DMC-5 catalyst

## 2. Polymer characterizations.

### 2.1. FT-IR spectra of reaction mixture in CH<sub>2</sub>Cl<sub>2</sub>.

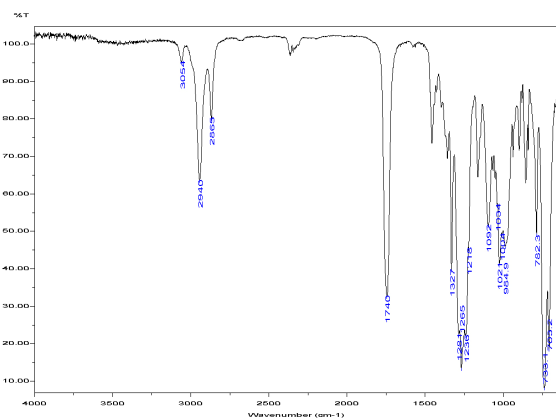


Fig. S6. Reaction condition: CHO-2.5 ml, DMC-1 - 5mg, P<sub>CO2</sub>-9.7 bar, 100 W, 30 min

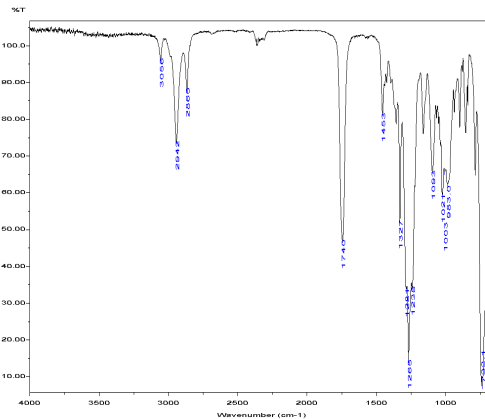


Fig. S7. Reaction condition: CHO-5 ml, DMC-1 - 5mg, P<sub>CO2</sub>-9.7 bar, 100 W, 30 min

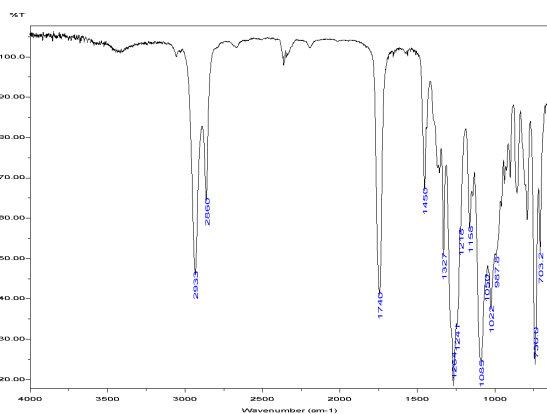


Fig. S8. Reaction condition: CHO-5 ml, DMC-1 - 10mg, P<sub>CO2</sub>-9.7 bar, 200 W, 4.5 min

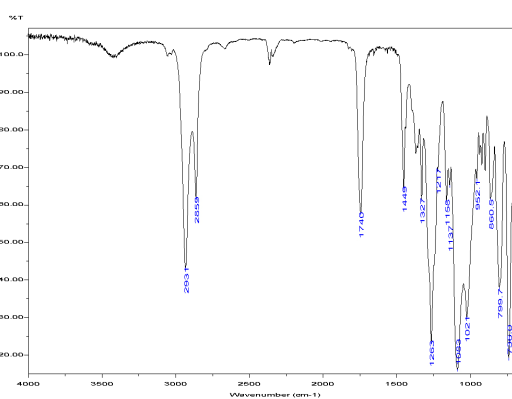


Fig. S9. Reaction condition: CHO-5 ml, DMC-1 - 20mg, P<sub>CO2</sub>-9.7 bar, 100 W, 6 min

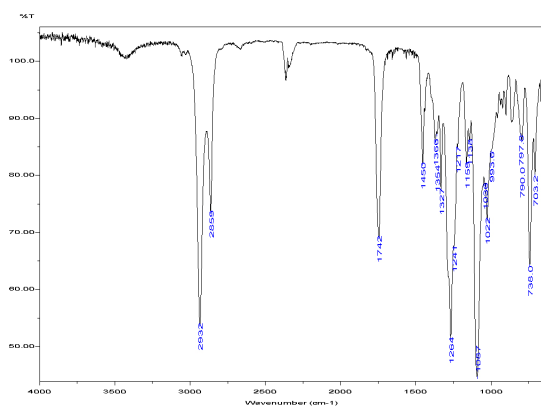


Fig. S10. Reaction condition: CHO-5 ml, DMC-1 -  
10mg, P<sub>CO2</sub>-9.7 bar, 300 W, 4 min

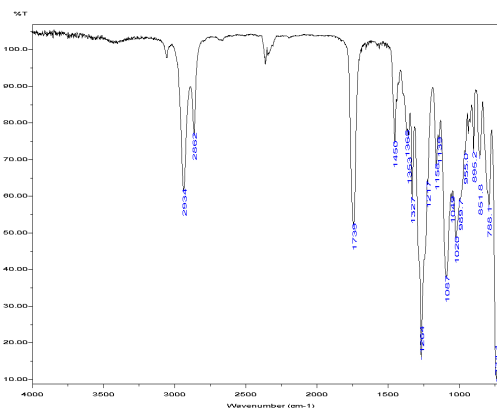


Fig. S11. Reaction condition: CHO-5 ml, DMC-1  
- 10mg, P<sub>CO2</sub>-9.7 bar, 400 W, 3.5 min

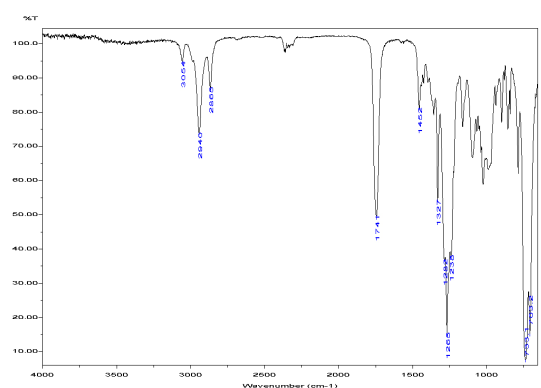


Fig. S12. Reaction condition: CHO-5 ml, DMC-2 -  
5mg, P<sub>CO2</sub>-9.7 bar, 100 W, 30 min

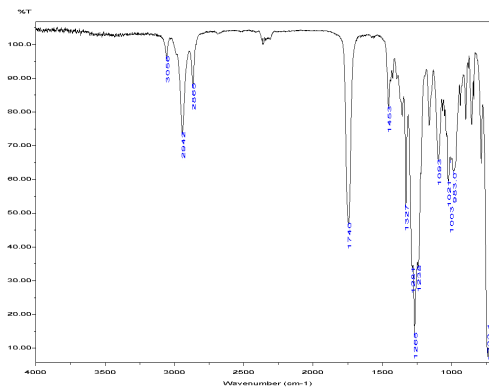
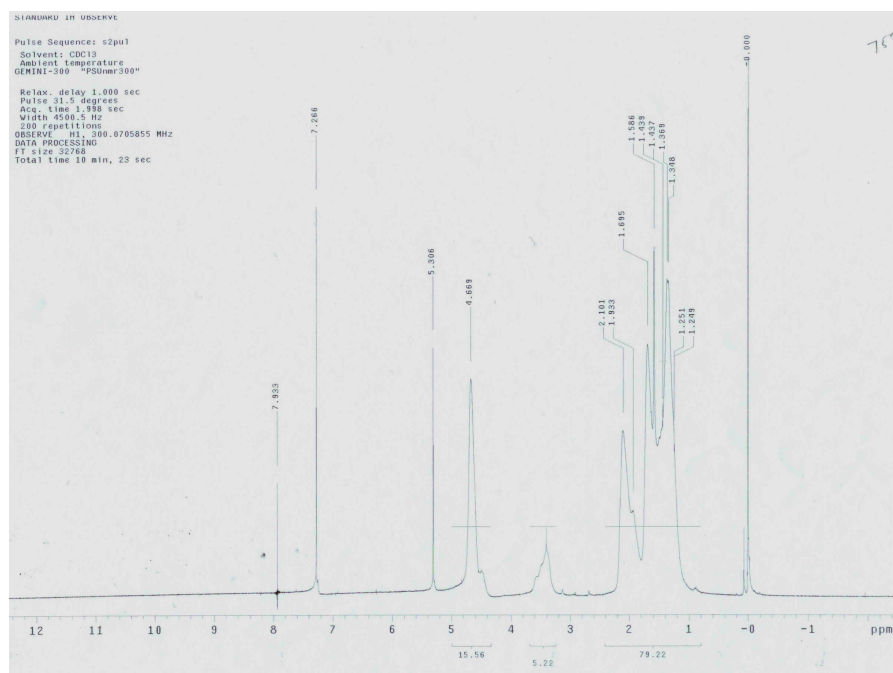
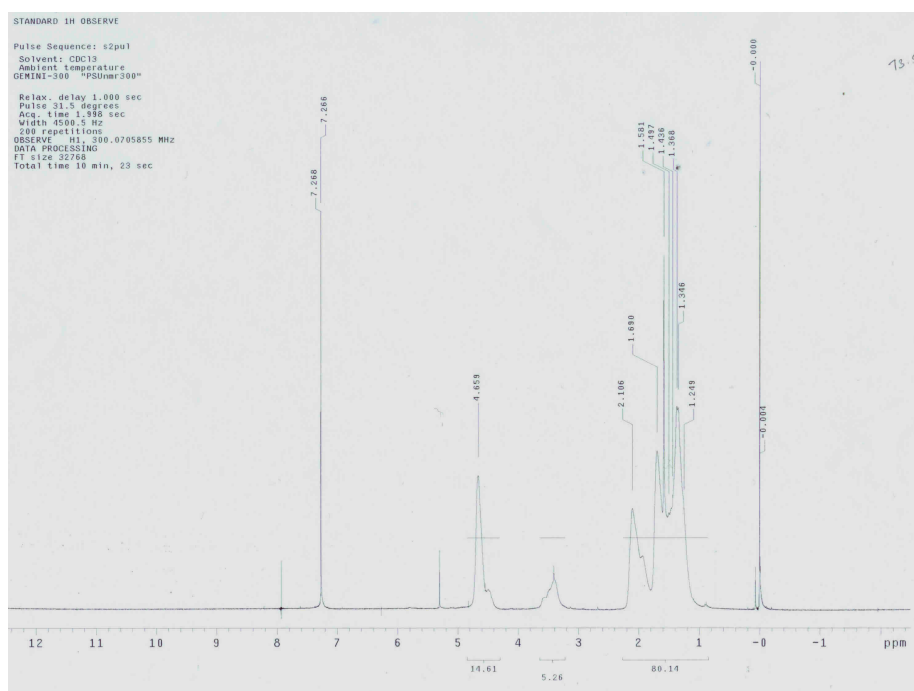


Fig. S13. Reaction condition: CHO-5 ml, DMC-3  
- 5mg, P<sub>CO2</sub>-9.7 bar, 100 W, 30 min

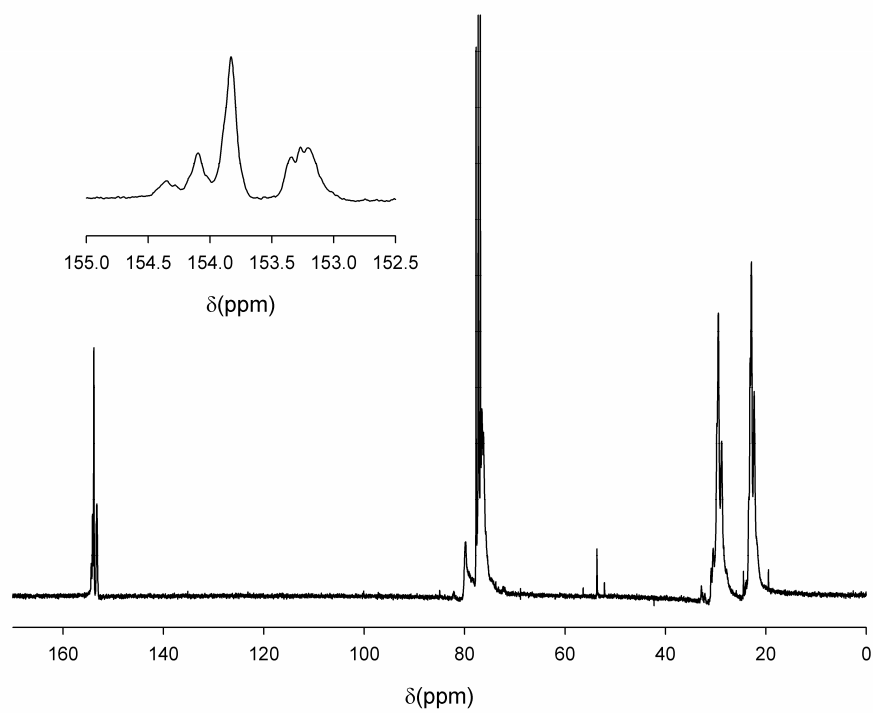
2.2. <sup>1</sup>H-NMR spectra of representative copolymers.







2.3.  $^{13}\text{C}$ -NMR spectra of representative copolymer.



2.4. GPC of representative copolymers.

