Supporting Information

One-step Synthesis of Quaternized Polyethyleneimine and Application in Transesterification Reactions

Junqiang Zhou [a, c, #], Zhentao Zhao [a, #], Yuxin Wang [a], Guangwen Xu [a, c, 1], Lei Shi [a, b, c, d *]

([a] Key Laboratory on Resources Chemicals and Materials of Ministry of Education, Shenyang University of Chemical Technology, Shenyang 110142, PR China;

[b] Xinjiang Zhichuang Materials Co., Ltd., Shihezi, Xinjiang 832000, China;

[c] Institute of Industrial Chemistry and Energy Technology, Shenyang University of Chemical Technology, Shenyang 110142, PR China;

[d] Xinjiang Tianye (Group) Co., Ltd., Shihezi, Xinjiang 832000, China.)

* Corresponding author.

[#] Junqiang Zhou and Zhentao Zhao contributed equally to this work.

E-mail address: shilei@syuct.edu.cn (Lei Shi)

1. Gas verification in catalyst synthesis

Experimental procedure: 10 g of B-PEI and 20 g of DMC were added to the reactor and slowly heated to 100 °C. The mixture was continuously stirred for 6 h. After cooling to room temperature, the discharged gas was collected. The GC-4100 gas chromatograph, calibrated with nitrogen, was used for component analysis. As shown in Fig. S1, the results indicate that the gas is primarily composed of CO_2.

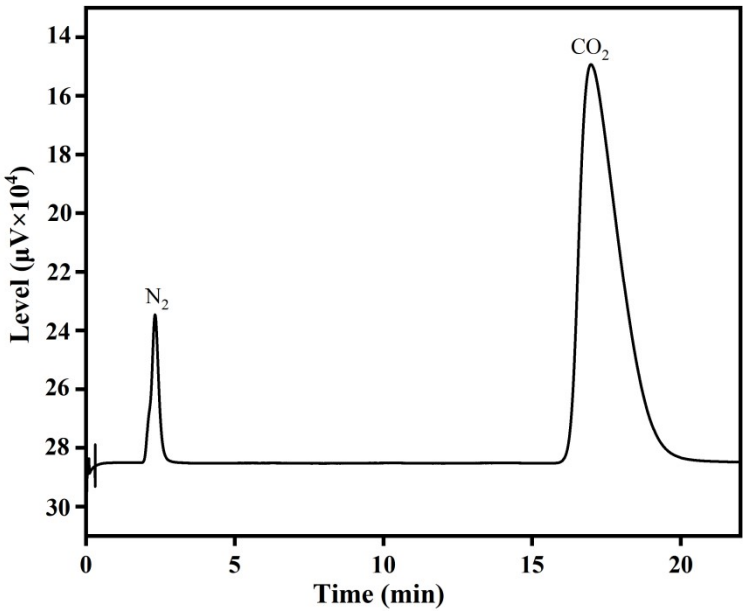

Fig. S1. Gas verification in catalyst synthesis.

2. Liquid validation in catalyst synthesis

Experimental procedure: 10 g of B-PEI and 20 g of DMC were added to a reactor and slowly heated to 100 °C. The mixture was continuously stirred for 6 h. When the mixture was cooled to room temperature, the liquid was transferred to a rotary evaporator and evaporated at –0.1 MPa at 50, 60, and 70 °C for 30 min, and finally at 80 °C for 1 h. The effluent was analyzed using a GC-2010 Pro gas chromatograph. As shown in Fig. S2, the results indicate that the effluent is mainly composed of unreacted DMC and a small amount of MeOH

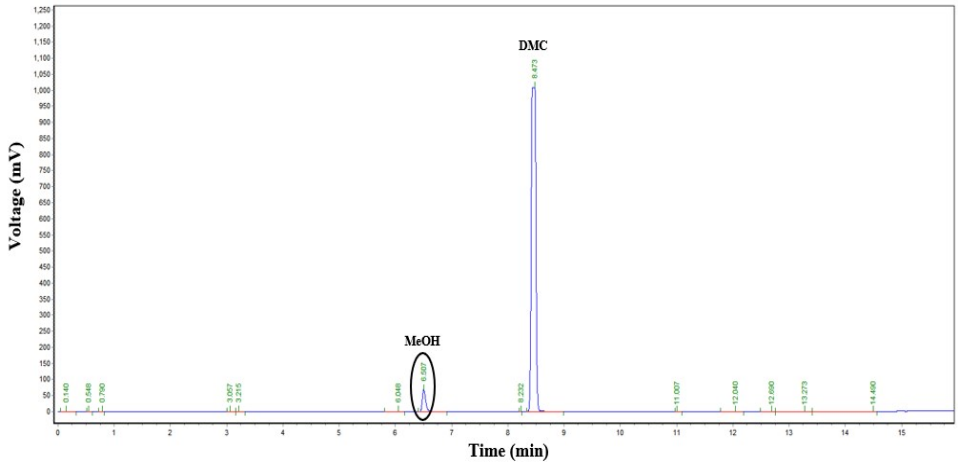

Fig. S2. Verification of methanol in catalyst synthesis.

3. ^{13}C NMR of D-BPEI after six uses

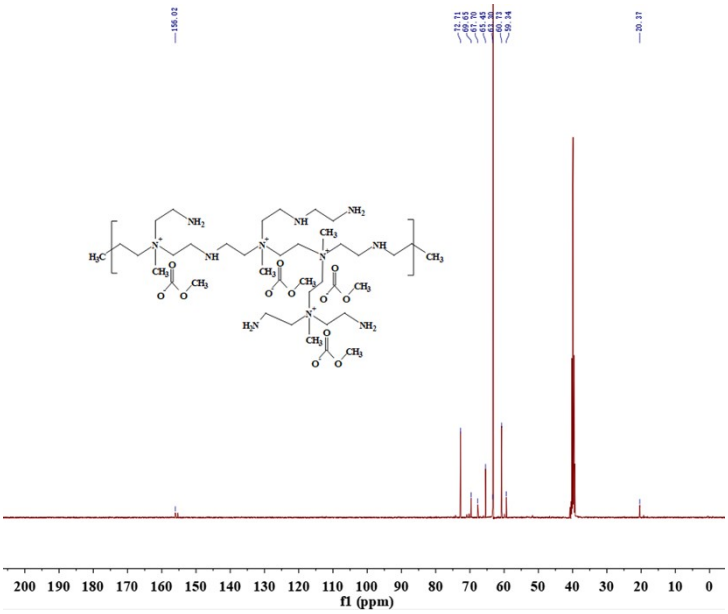

Fig. S3. ^{13}C NMR of D-BPEI after six uses.