Supporting Information: The Influence of Polyethylene Glycol on the Synthesis and Activity of MoP for the Hydrodechlorination of Trichloroethylene

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Experimental Details

Trichloroethylene HDC reactions were carried out on a continuous fixed-bed quartz reactor (id. = 10 mm) at 400-650^{o}C and atmospheric pressure. 6 mL catalyst was put in the middle of the quartz reactor. The hydrogen flow rate was 100 mL/min. The produced HCl was trapped in a water bubbler and the amount of formed HCl can be determined very accurately by NaOH titration with a pH-indicator. So the decomposition rate of C-Cl bonds, can be calculated as the following formula:

$$R_{\text{C-Cl bonds decomposition}} = \frac{n(HCl)}{3n(C_2HCl_3)} \times 100\%$$

Characterization

Table S1 Intensity of different crystal planes

	I(100)	I(101)	I(102)	I(201)
PDF-65-6487	982.6	1417.9	155.7	185.1
MoP	1293	1792	311	282
MoP-PEG8000	1672	2641	449	336

These data are collected from XRD Characterization and PDF (65-6487). We choose peak height as intensity of crystal plane. The relative intensity of peaks can be calculated as the following formula:

$$R_{\text{Relative intensity of peaks}} = \frac{\text{Peak Height}}{\text{Maximum of Peak Height}} \times 100\%$$

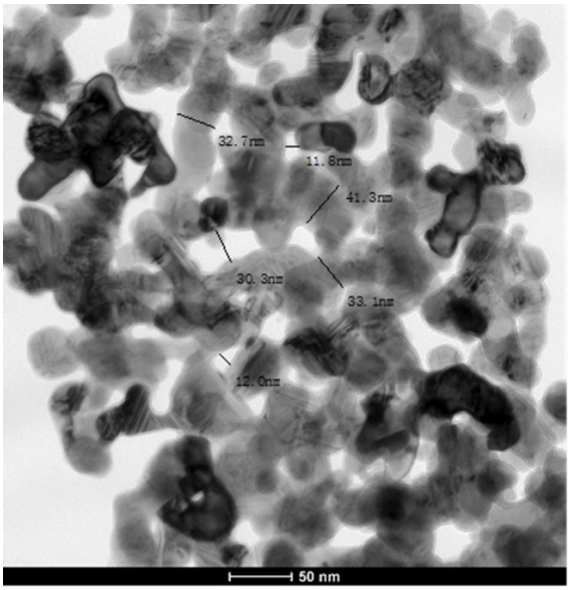

Fig.S1 TEM images of MoP-PEG8000

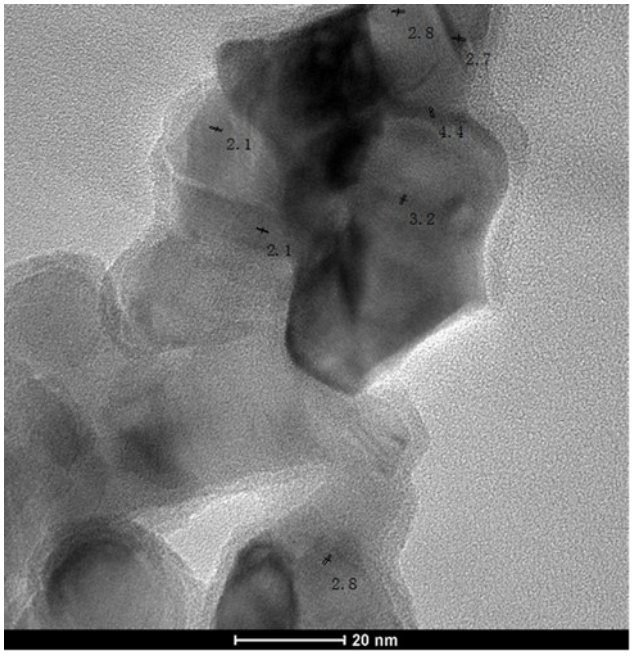

Fig.S2 Lattice spacing of MoP

The length of lattice spacing were measured and estimated by Digital Micrograph (a software) in the Fig.S1and S2. Contrasted with PDF-65-6487, lattice spacing corresponds to crystal plane.

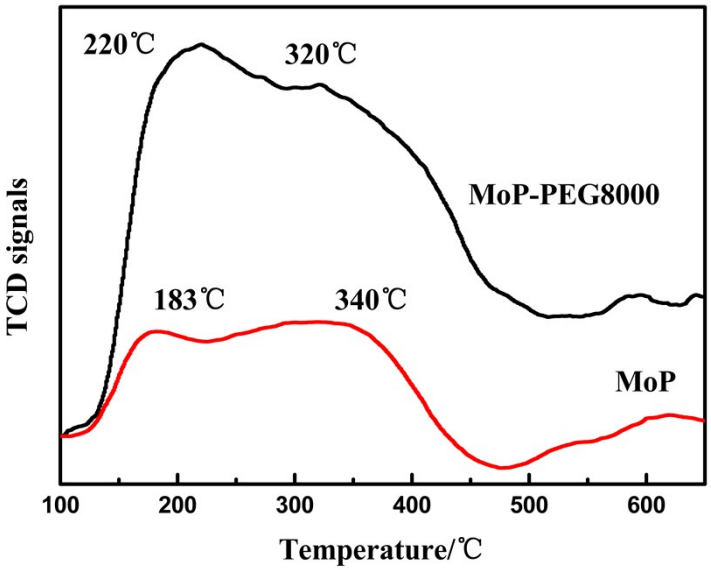

Fig.S3 NH_3-TPD profiles of MoP and MoP-PEG8000 catalysts

Fig.S3 shows the NH_3-TPD profiles of MoP and MoP-PEG8000 catalysts. MoP shows two desorption peaks at 183℃and 340℃, corresponding to weak acid sites and mediate strong acid sites, respectively. However, only mediate strong acid sites of MoP-PEG8000 are corresponding to 220℃ and 320℃. Both catalysts show mediate strong acid sites, but peak area of MoP-PEG8000 is greater than MoP's. Adding PEG can change the structure of MoP, which further leads to the changes of the acid sites of MoP.