Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Heteropolyacids Embedded in Lipid Bilayer Covalent to Graphene Oxide for Facile One-Pot Conversion of Glycerol to Lactic Acid

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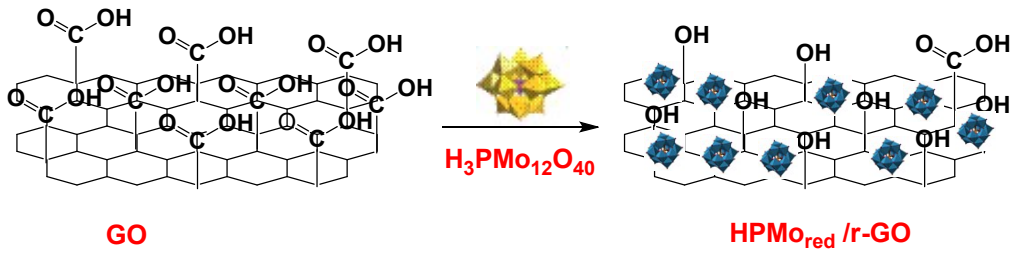

Scheme S1. Illustration of the formation of HPMo/r-GO.

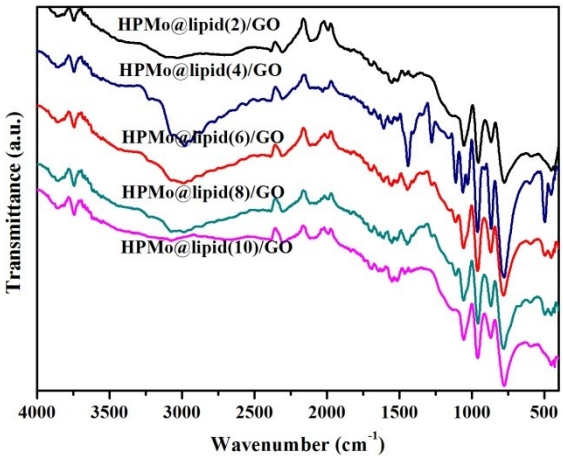

Fig. S1 FTIR spectra of HPMo@lipid(n)/GO catalysts.

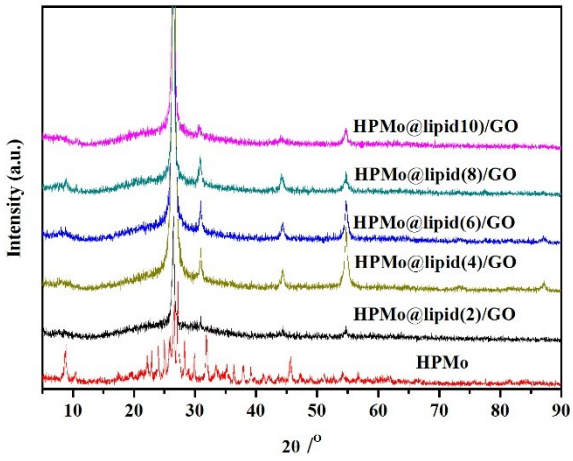

Fig. S2 XRD spectra of HPMo@lipid(n)/GO catalysts.

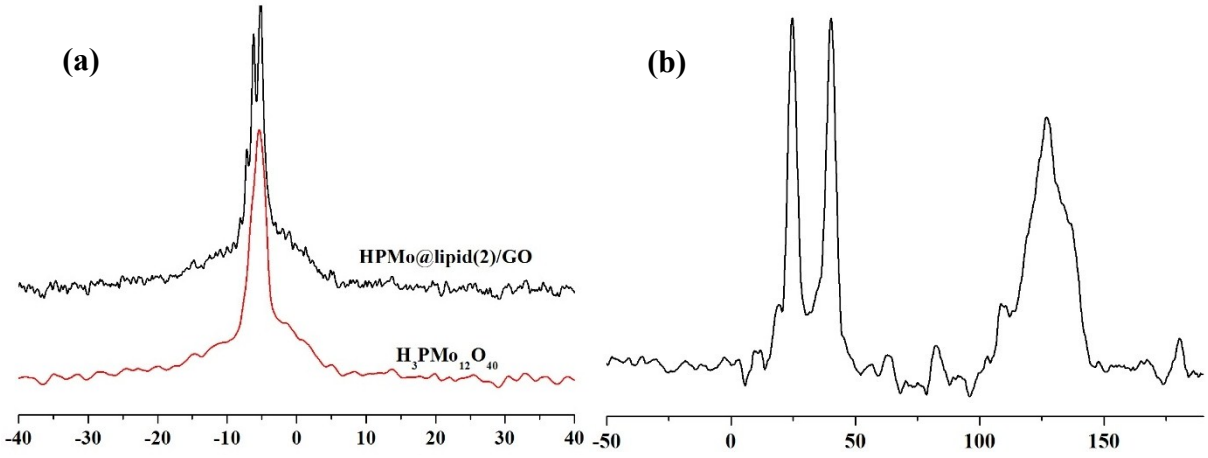

Fig. S3 The ^{31}P MAS NMR spectra (a) and ^{13}C MAS NMR spectra(b) of HPMo@lipid(2)/GO.

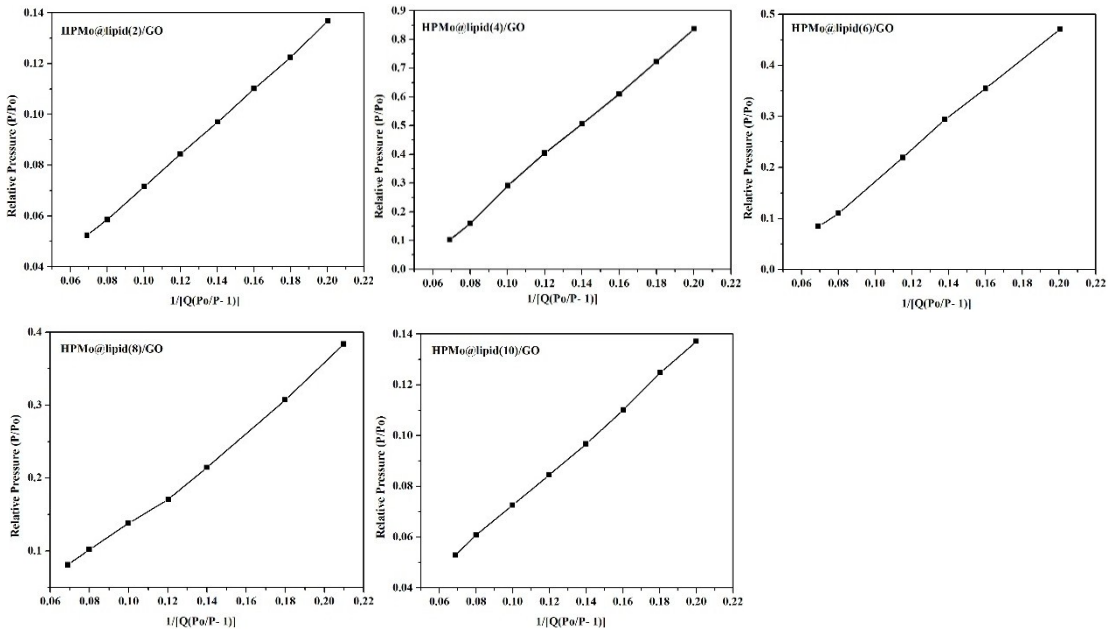

Fig. S4 BET of HPMo@lipid(n)/GO catalysts.

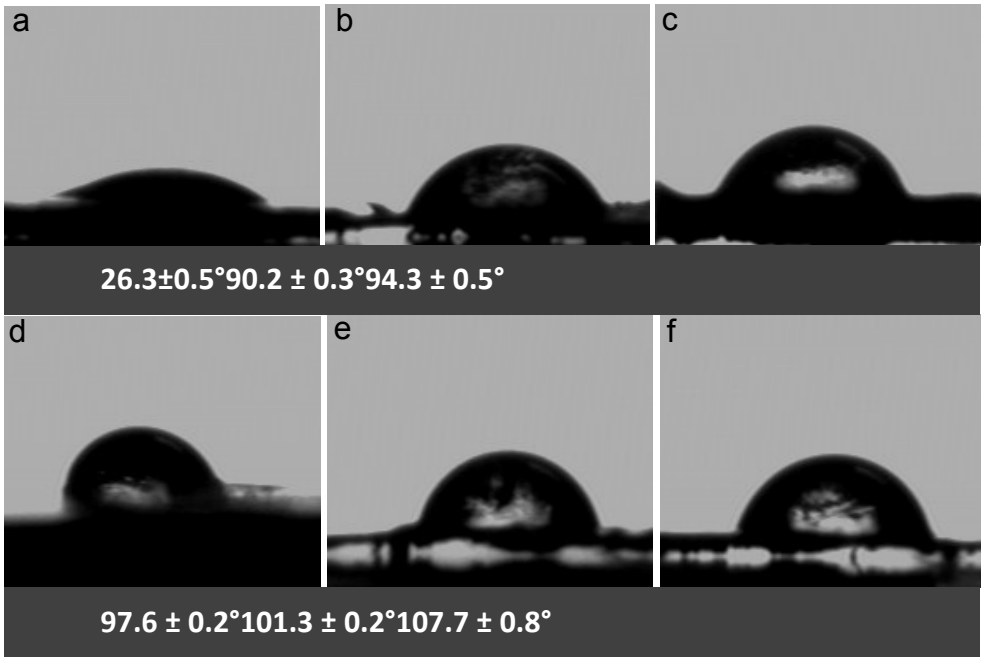

Fig. S5 The CA of HPMo (a), HPMo@lipid(2)/GO (b), HPMo@lipid(4)/GO (c), HPMo@lipid(6)/GO (d), HPMo@lipid(8)/GO(e),and HPMo@lipid(10)/GO.

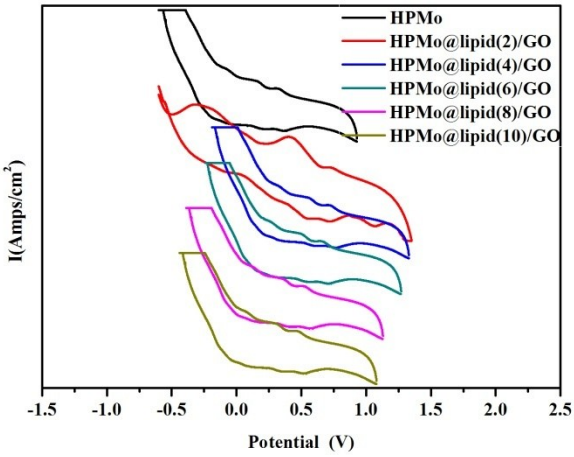

Fig.S6 CV-potential curves of HPMo and HPMo@lipid(n)/GO catalysts.

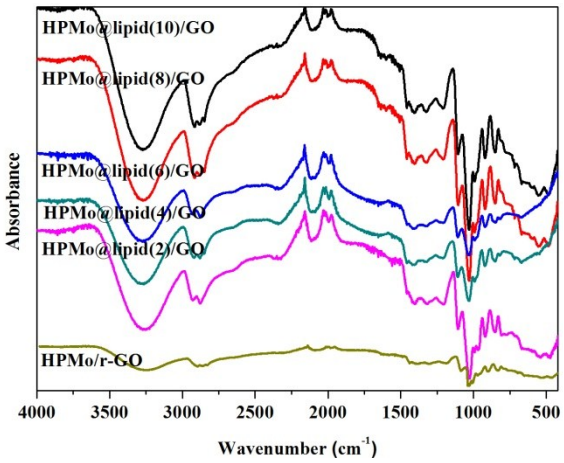

Fig. S7 FTIR of HPMo@lipid(n)/GO after glycerol adsorption.

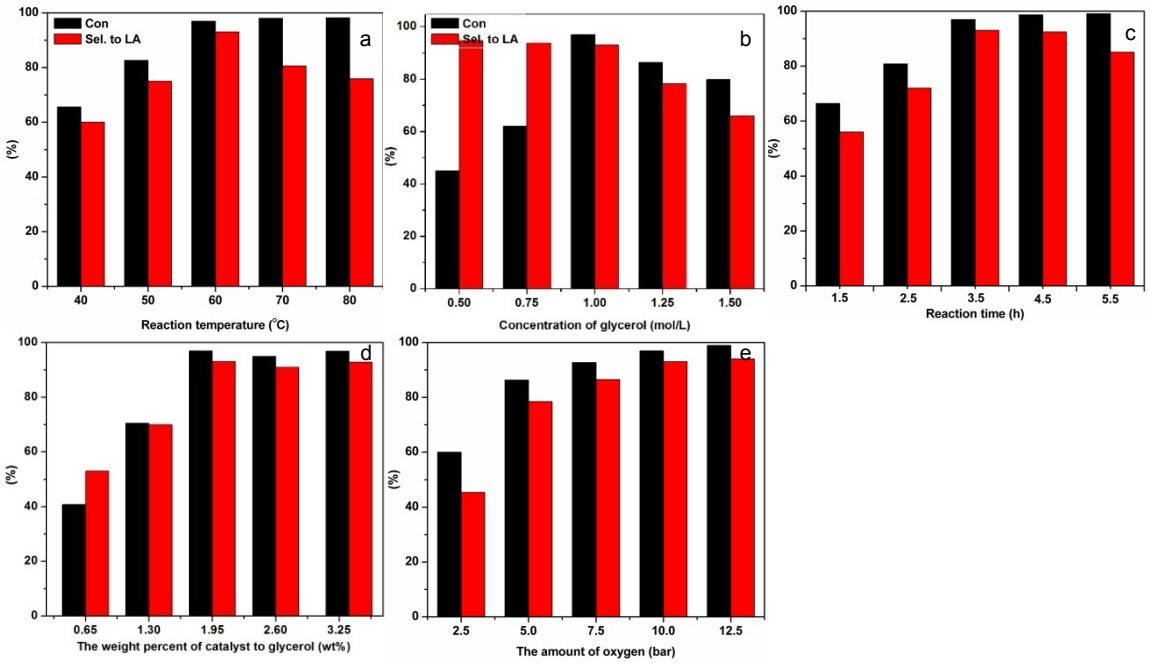

Fig. S8 The conversion and selectivity of oxidation of glycerol with various process parameters:
(a) Reaction temperature (1.95 wt%of HPMo@lipid(4)/GO, 1 mol/L of glycerol, 3.5 h,10 bar);
(b) Concentration of glycerol (1.95 wt%of HPMo@lipid(4)/GO, 60 ºC, 3.5 h, 10 bar);
(c) Reaction time (1.95 wt%of HPMo@lipid(4)/GO, 1 mol/L of glycerol, 60 ºC, 10 bar);
(d) Amount of catalyst (1 mol/L of glycerol, 60 ºC, 3.5 h, 10 bar);
(e) The amount of oxygen (1.95 wt%of HPMo@lipid(4)/GO, 1 mol/L of glycerol, 60 ºC, 3.5 h).

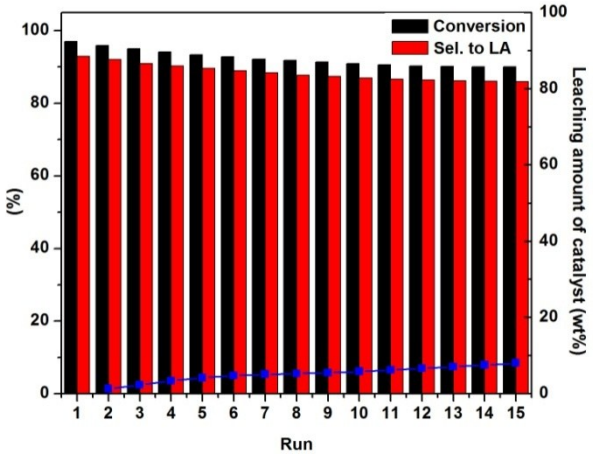

Fig. S9 Reusability test catalyzed by HPMo@lipid(4)/GO in oxidation of glycerol. Reaction conditions: 1.95 wt% of catalyst, 1 M of glycerol, 60 ºC, 3.5 h, 10 bar, 800 rpm.

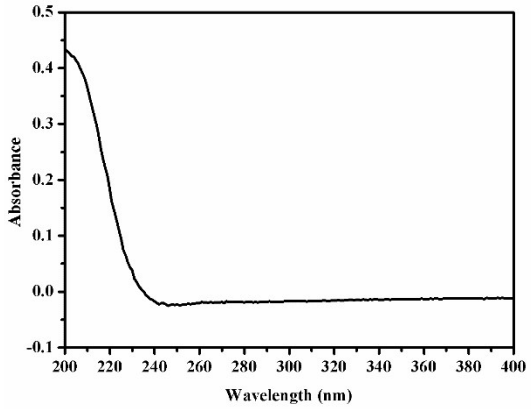

Fig. S10 Uv-Vis spectrum of the reaction mixture obtained after glycerol conversion over HPMo@lipid(4)/GO.

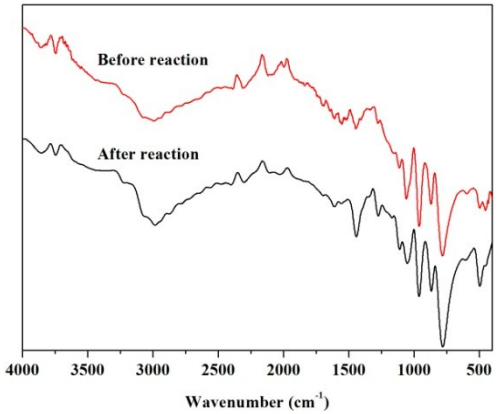

Fig. S11 FTIR spectra of HPMo@lipid(4)/GObefore and after reaction.

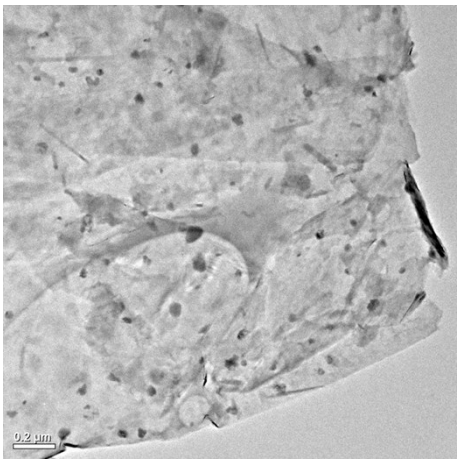

Fig. S12 SEM spectra of HPMo@lipid(4)/GOafter reaction.