Ultrahigh yield synthesis of mesoporous carbon nanoparticles as superior lubricant additives of polyethylene glycol

Zihao Mou[a], Baogang Wang[a*], Zhiyu Huang[a] and Hongsheng Lu[a*]

[a] *College of Chemistry and Chemical Engineering, Southwest Petroleum University, Chengdu 610500, P. R. China*

[*] Corresponding authors. E-mail: bgwang@swpu.edu.cn & hshlu@163.com; Fax: +86-28-83037330; Tel: +86-28-83037330

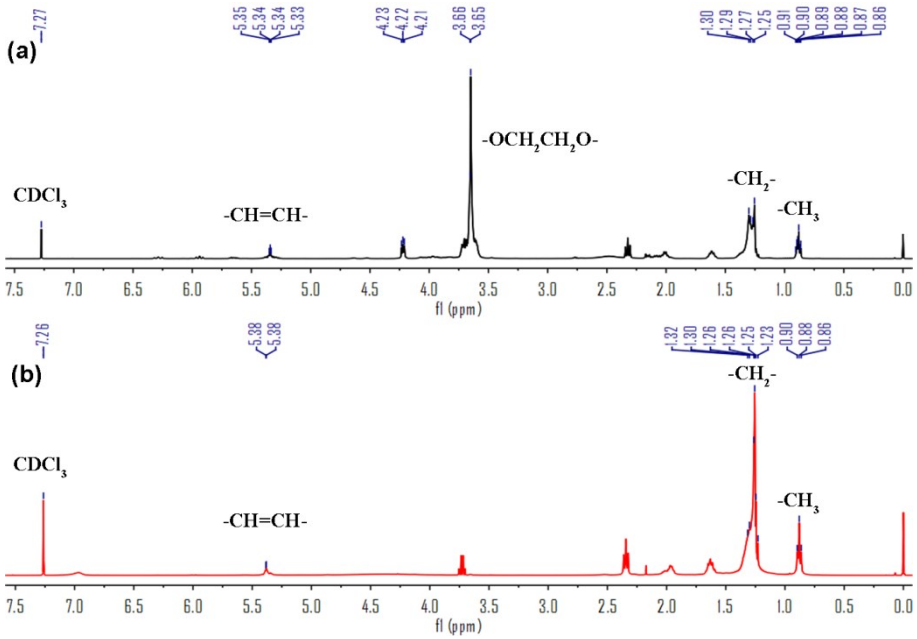

Fig. S1 ^{1}H NMR spectra of (a) Tween 85 and (b) MCNPs in $CDCl_3$.

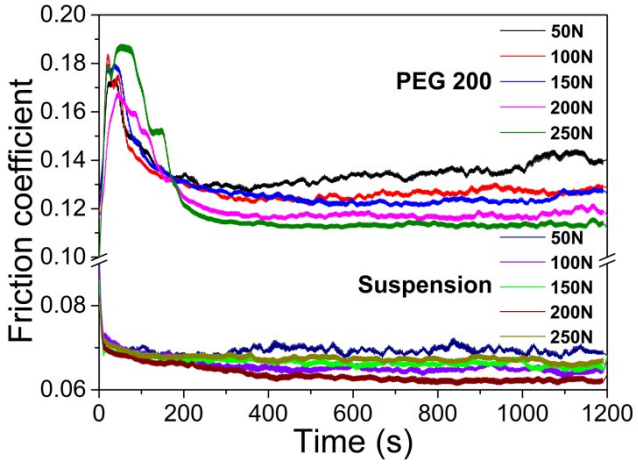

Fig. S2 Friction coefficients curves of PEG200 and MCNPs (0.7 wt%)/PEG200 suspension under different loads.

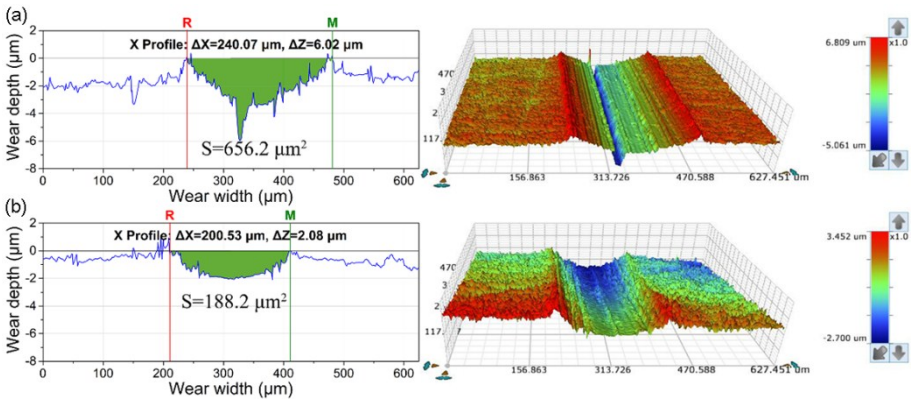

Fig. S3 Two- and three-dimensional profiles of wear scars of lower plates lubricated by (a) PEG200 and (b) MCNPs (0.7 wt%)/PEG200 suspension under the load of 50 N.

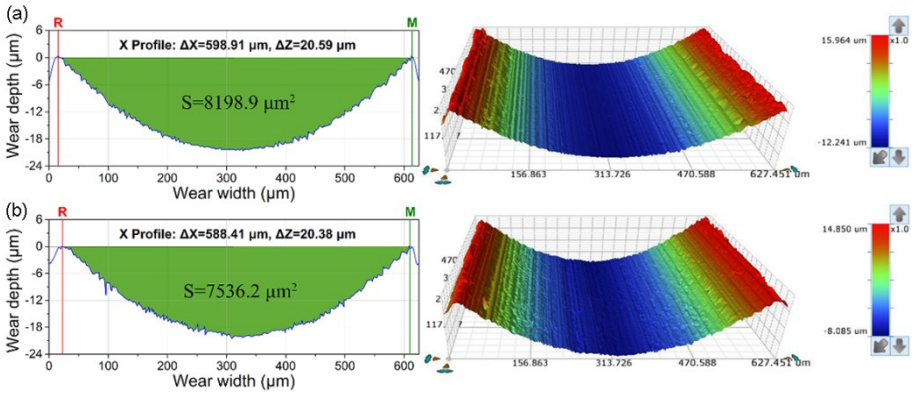

Fig. S4 Two- and three-dimensional profiles of wear scars of lower plates lubricated by (a) PEG200 and (b) MCNPs (0.7 wt%)/PEG200 suspension under the load of 250 N.

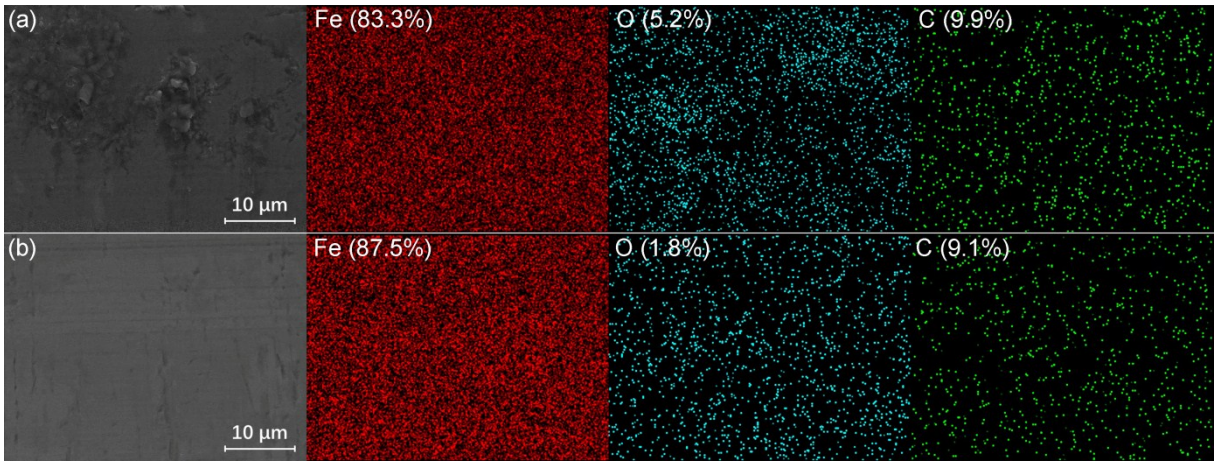

Fig. S5 SEM images and corresponding selected area elemental maps of wear scars of lower plates lubricated by (a) PEG200 and (b) MCNPs (0.7 wt%)/PEG200 suspension (load: 100 N; sliding speed:

10 mm/s; duration: 20 min).

Table S1 XPS elemental compositions of wear scars of lower plates lubricated by PEG200 and MCNPs (0.7 wt%)/PEG200 suspension (load: 100 N; sliding speed: 10 mm/s; duration: 20 min).

Lubricant	Fe (%)	Cr (%)	C (%)	O (%)	Total (%)
PEG200	48.78	0.78	13.67	36.76	100.00
Suspension	45.72	1.18	16.83	36.27	100.00