Electronic Supplementary Material (ESI) for Dalton Transactions.

Tribological properties of a series of carbon dots modified by ionic liquids with various anion species: experimental findings and density functional theory calculations

Baogang Wang[a*], Lilong Zhang[a], Na Wang[a], Wenmeng Duan[a] and Weiwei Tang[b*]

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

[b] *College of Biological and Chemical Engineering, Panzhihua University, Panzhihua 617000, P. R. China*

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

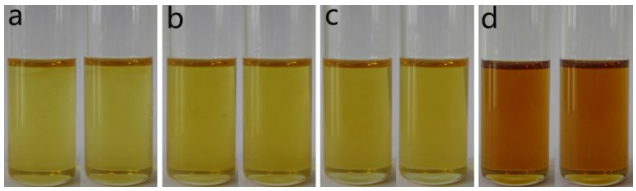

Fig. S1 Optical photos of CDs-ILs-X/PEG200 suspensions containing (a) 0.20 wt% of CDs-ILs-NTf_2, (b) 0.17 wt% of CDs-ILs-PF_6, (c) 0.10 wt% of CDs-ILs-BScB and (d) 0.80 wt% of CDs-ILs-OL. The left and right photos in (a-d) are obtained from the suspensions after preparation and standing for 3 months, respectively.

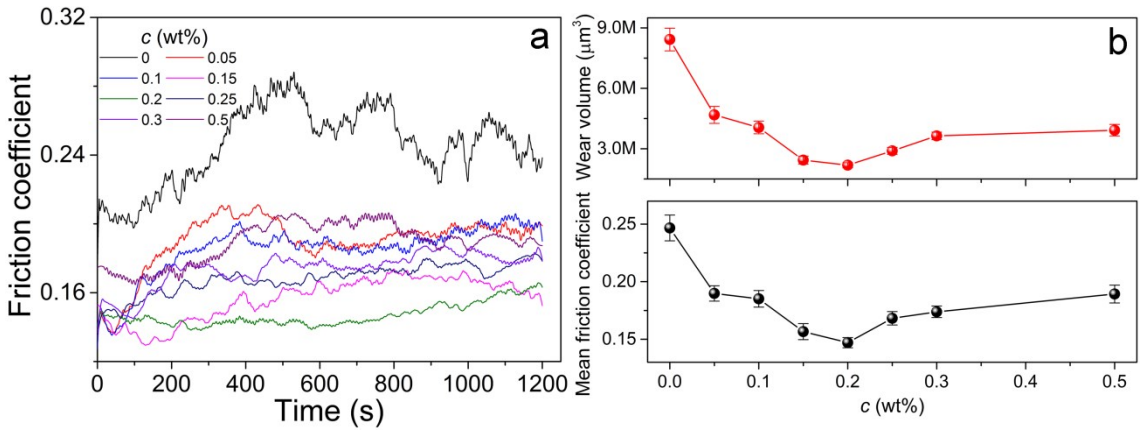

Fig. S2 (a) Friction coefficient curves of the CDs-ILs-NTf_2/PEG200 suspensions containing different *c* of CDs-ILs-NTf_2. (b) The mean friction coefficient and wear volume of the lower plate lubricated by CDs-ILs-NTf_2/PEG200 suspension varying with the increasing *c* of CDs-ILs-NTf_2.

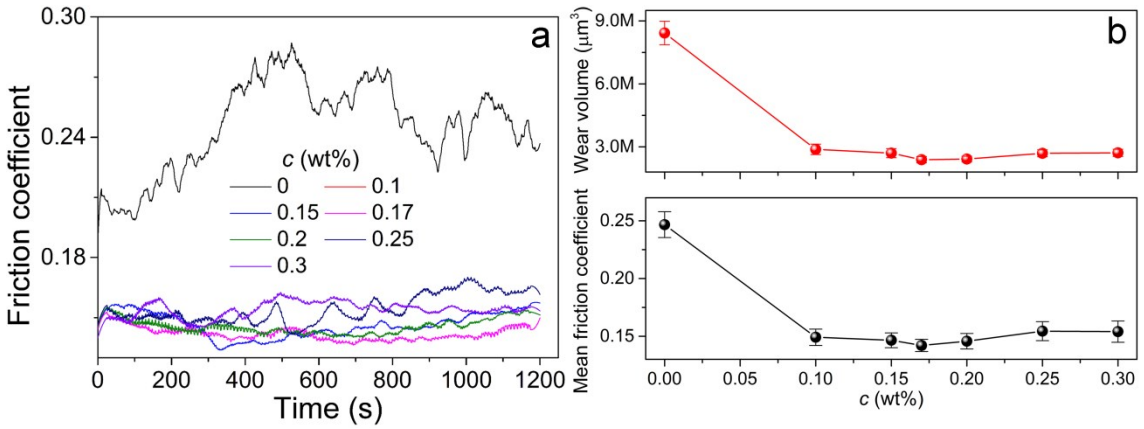

Fig. S3 (a) Friction coefficient curves of the CDs-ILs-PF_6/PEG200 suspensions containing different *c* of CDs-ILs-PF_6. (b) The mean friction coefficient and wear volume of the lower plate lubricated by CDs-ILs-PF_6/PEG200 suspension varying with the increasing *c* of CDs-ILs-PF_6.

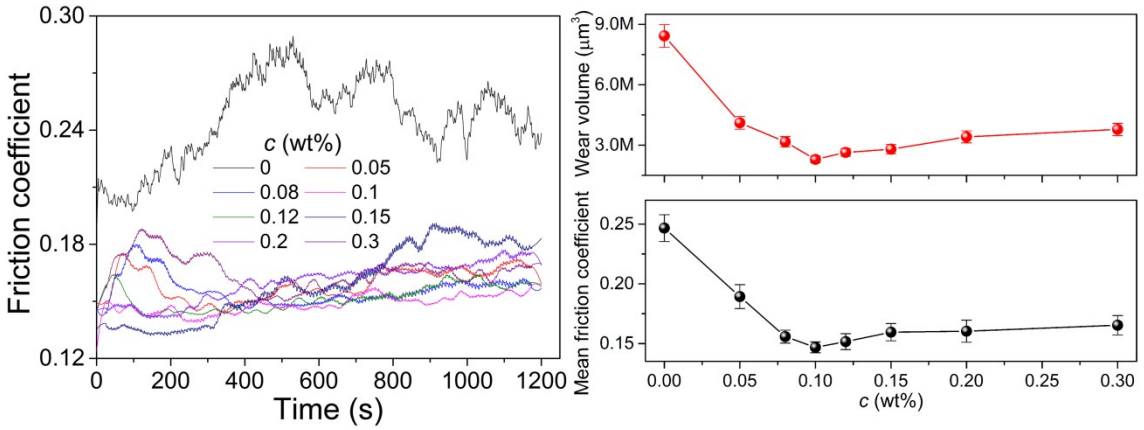

Fig. S4 (a) Friction coefficient curves of the CDs-ILs-BScB/PEG200 suspensions containing different *c* of CDs-ILs-BScB. (b) The mean friction coefficient and wear volume of the lower plate lubricated by CDs-ILs-BScB suspension varying with the increasing *c* of CDs-ILs-BScB.

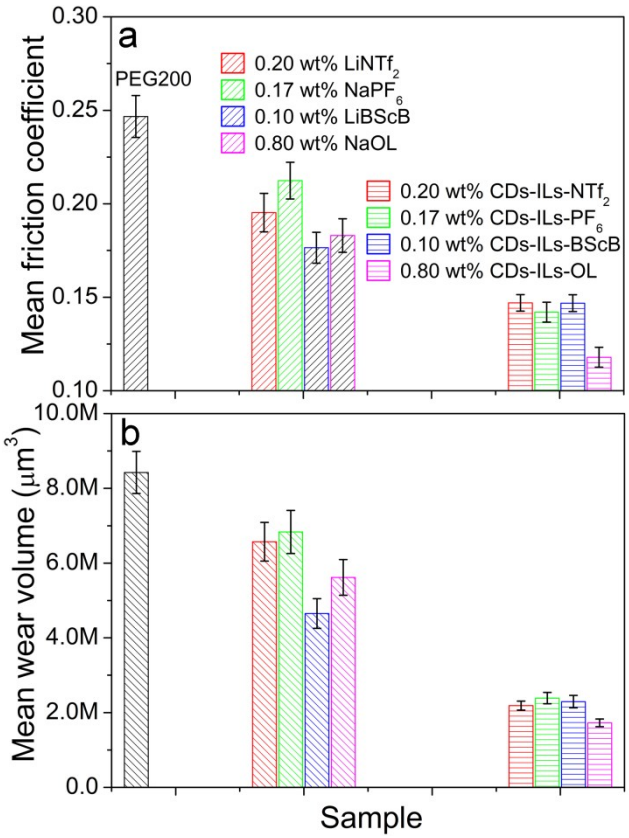

Fig. S5 (a) The mean friction coefficients and (b) wear volumes of the lower plates lubricated by PEG200, PEG200 solutions containing various salts, and CDs-ILs-X/PEG200 suspensions.

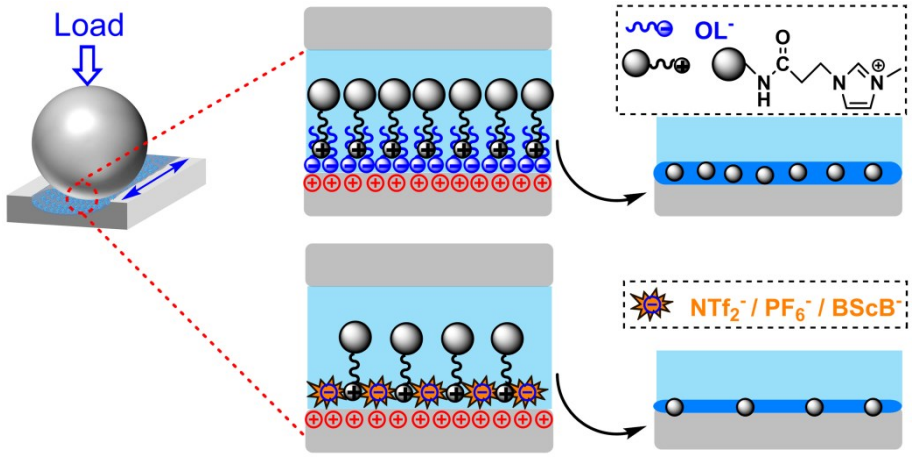

Fig. S6 Schematic illustration of the lubricating mechanisms of CDs-ILs-X.