Supporting Information

In-situ deagglomeration and surface functionalization of detonation nanodiamond with polymer was used as lubricant additives in oil.

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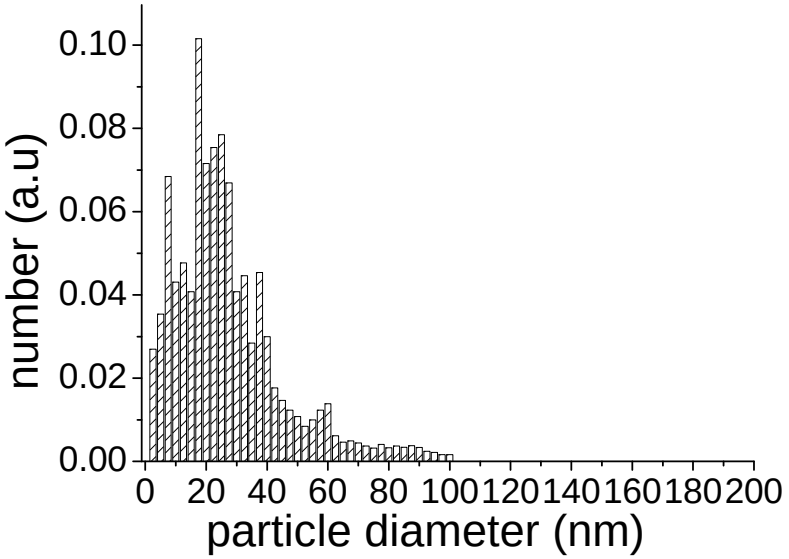
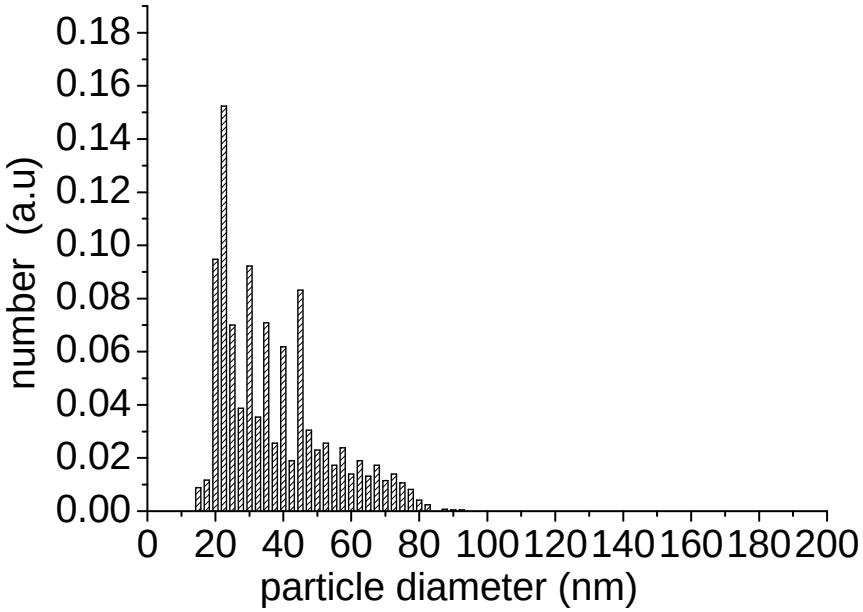
Table S1. Rheological properties of CPC R68 oil.

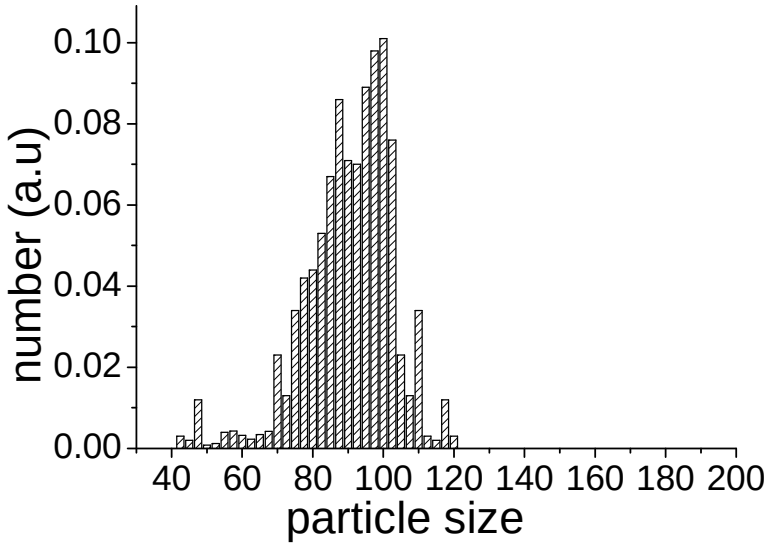
Grade no.	R68
Specific gravity at 15.6 ◦C	0.8838
Viscosity, Kin., cSt (at 40 ◦C) (at 100 ◦C)	67.83 8.62
Viscosity index	98
Pour point (◦C)	-12
Flash point, COC (◦C)	264
Color (ASTM D1500)	L1.0
Total acid number (mg KOH/g)	0.08
Carbon residue, Rams. (%)	0.08
Product no.	LA60343



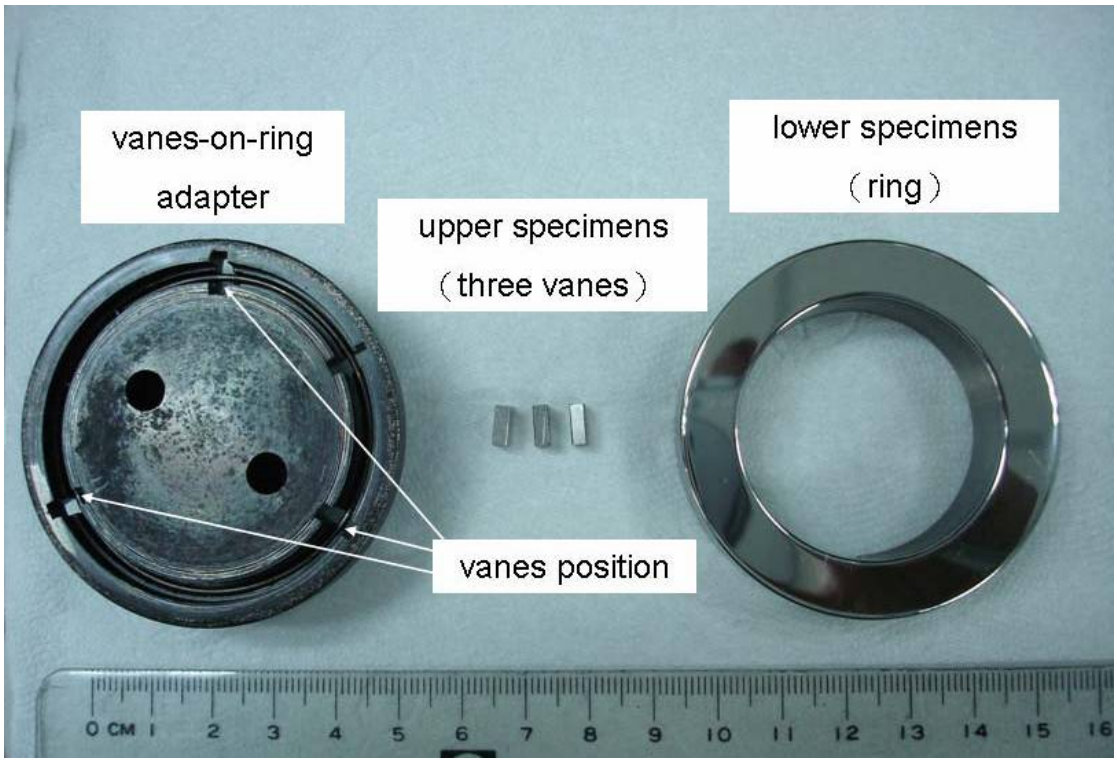
FigS1(a). The particle size distribution of dUDD-PGMA in DMSO.



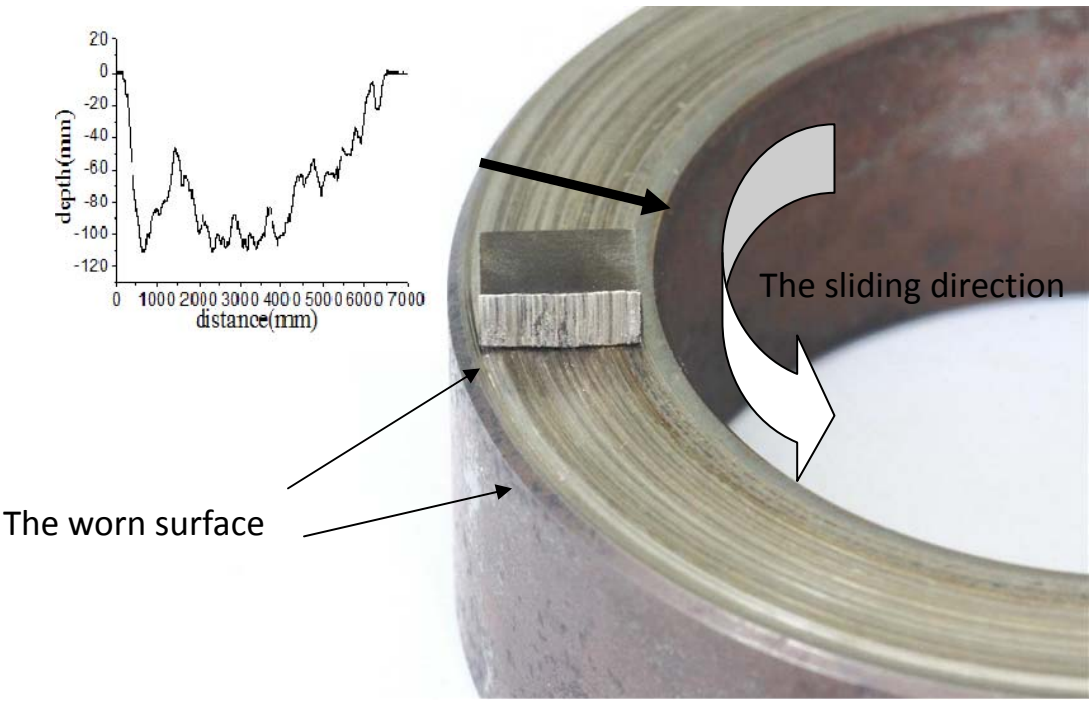
FigS1(b). The particle size distribution of dUDD-PMMA in THF.



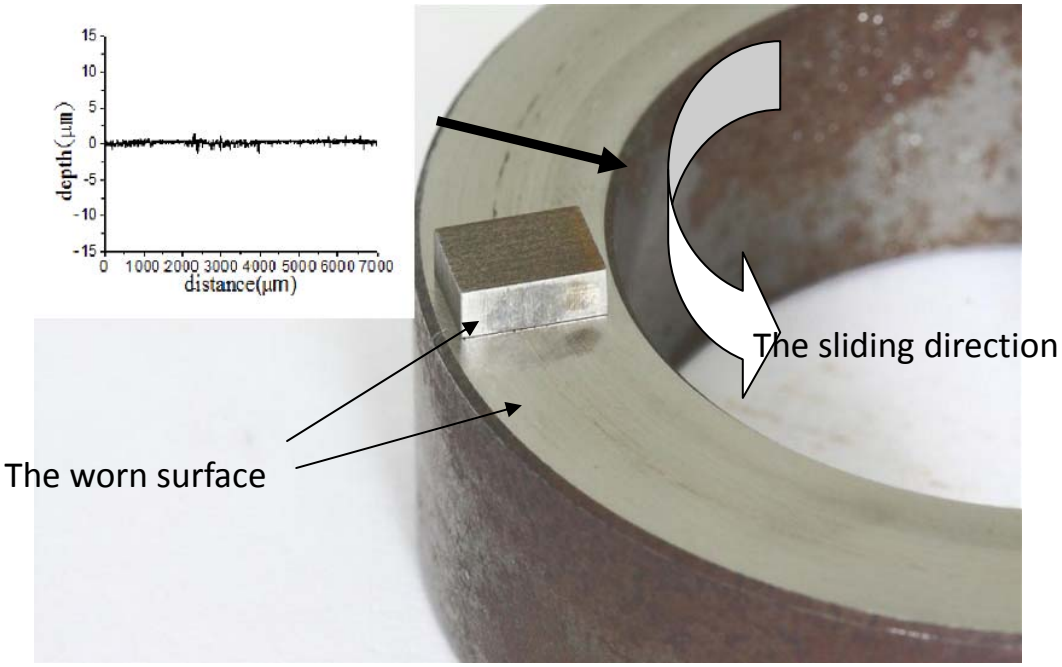
FigS1(c). The particle size distribution of dUDD-PS in toluene.



FigS2. Photograph of Vanes-on-ring adapter、upper and lower specimens.



FigS3. Photograph of the worn surface of upper and lower specimen in based oil without additive. Inset figure: α-stepper analysis along from the arrow direction.



FigS4. Photograph of the worn surface of upper and lower specimen in based oil with 2000ppm dUDD-PMMA lubricant additive. Inset figure:α-stepper analysis along from the arrow direction.

Fig.S5(a) The SEM image of worn surface of lower specimens in R68 oil without dUDD-PMMA lubricant additive.

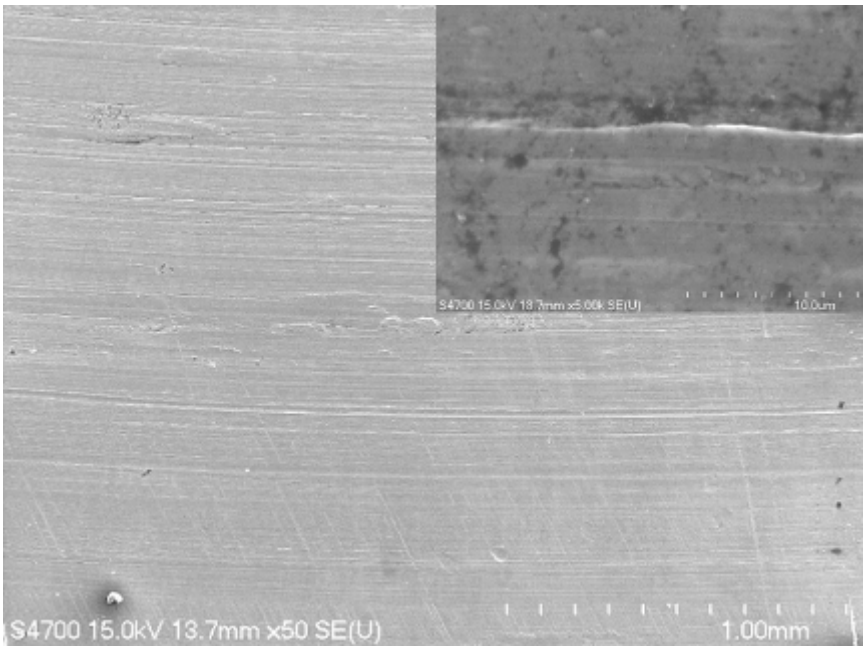


Fig.S5(b) The SEM image of worn surface of lower specimens in R68 oil with 3000 ppm dUDD-PMMA lubricant additive