Supporting Information

for

Dispersion of Alkylated Graphene in Organic Solvents and Its Potential for Lubrication Application

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Table S1: Infrared vibration frequencies of GrO and alkylated (OA-Gr, DDA-Gr, and ODA-Gr) graphene nanosheets with their vibrational assignment.

GrO	OA-Gr	DDA-Gr	ODA-Gr	Vibrational Assignment
3394.7	3452.9	3406.0	3439.7	O-H stretch
-	2958.1	2955.8	2952.0	C-H (CH_3) asym stretch
-	2922.5	2920.4	2920.3	C-H (CH_2) asym stretch
-	2851.9	2850.1	2849.5	C-H (CH_2) sym stretch
1723.8	-	-	-	C=O stretch (acid group)
-	1637.8	1648.9	1648.0	C=O stretch (Amide)
1619.5	-	-	-	C=C and H_2O (Overlapped)
-	1566.3	1577.1	1564.1	C=C and N-H (Overlapped)
-	1463.2	1465.8	1466.0	C-H bending
1372.2	-	-	-	O-H bending
1224.9	-	-	-	C-O stretch
-	1196.0	1203.5	1210.7	C-N stretch
1060.3	-	-	-	C-O-C stretch

Table S2: Raman characteristics of GrO and ODA_Gr

Sample Description	D band position, cm^{-1}	G band position, cm^{-1}	I_D/I_G
GrO	1330	1597	2.121
ODA-Gr	1311	1589	1.925

Figure S1

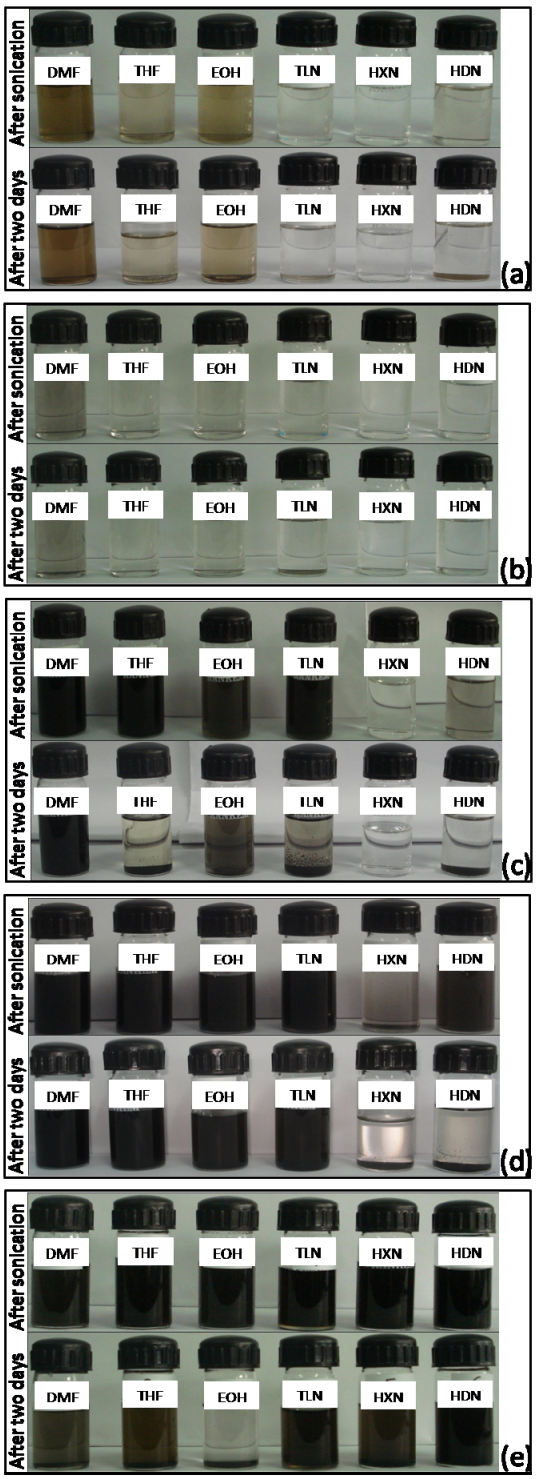

Figure S1: Dispersion of (a) GrO, (b) reduced graphene, (c) OA-Gr, (d) DDA-Gr, and (e) ODA-Gr nanosheets in Dimethylformamide (DMF), Tetrahydrofurane (THF), Ethanol (EOH), Toluene (TLN), Hexane (HXN), and n-Hexadecane (HDN). In each section, top images are after the sonication and bottom images are after two days. Dispersion concentration: 0.1 $mg.mL^{-1}$.

Figure S2

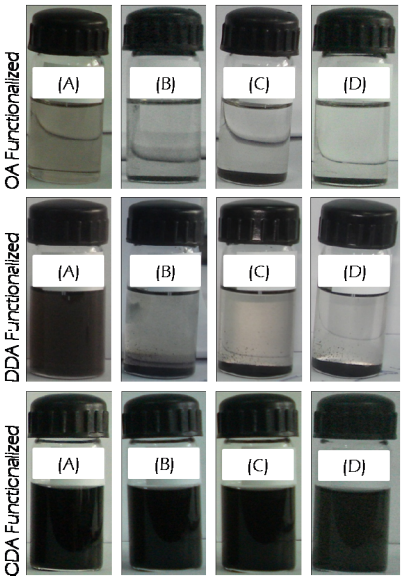

Figure S2: Dispersion of (i) OA-Gr, (ii) DDA-Gr, and (iii) ODA-Gr nanosheets in n-hexadecane. In each section dispersion images are taken with function of time. (A) Immediate after sonication, (B) after one day, (C) after two days, and (D) after five days; Dispersion concentration: 0.1 $mg.mL^{-1}$.

Figure S3

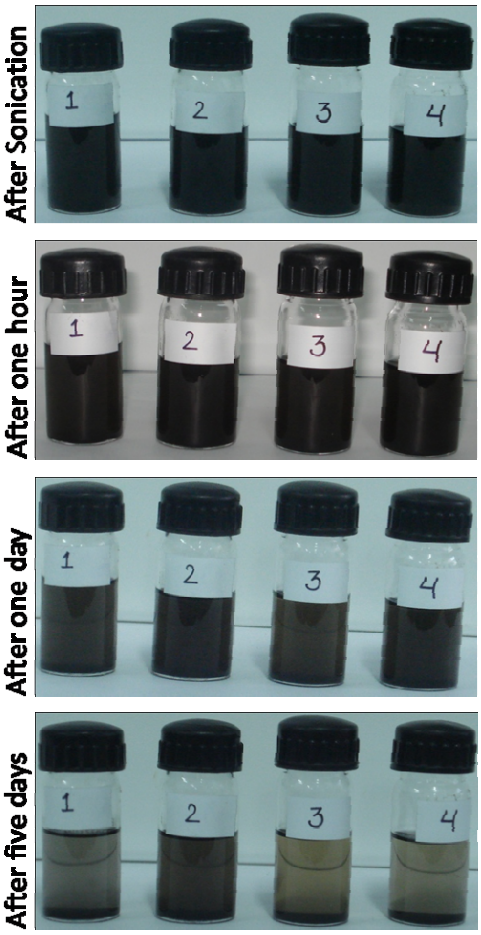

Figure S3: Dispersion of ODA-Gr nanosheets in (1) iso-octane, (2) decane, (3) decene, (4) hexadecene with function of time. Top images are after the sonication and the bottom images are after the five days. Dispersion concentration: 0.1 $mg.mL^{-1}$.