Supporting information

Seek the optimized transformer oil-based nanofluids by investigation

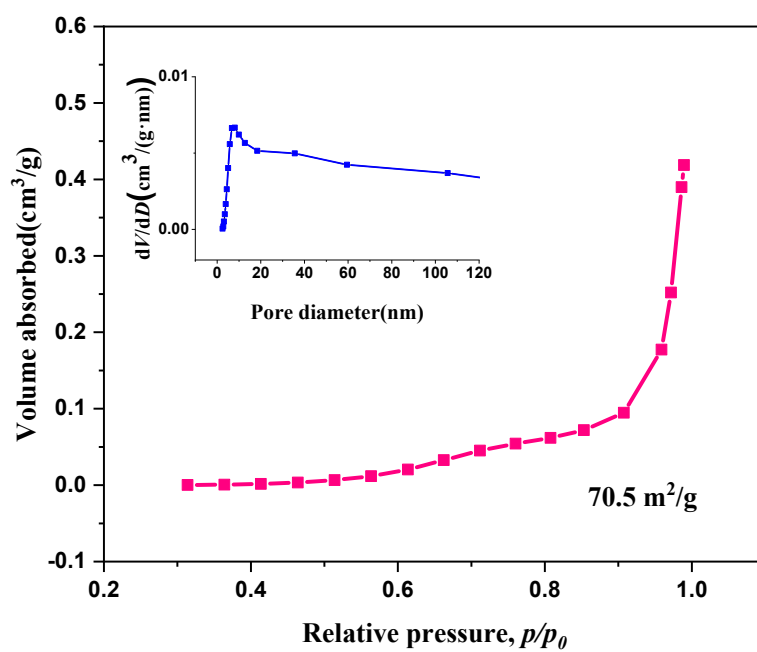**on modification mechanism of nano-dielectrics**

Figure S1. N$_2$ adsorption isotherms curves (insert is the corresponding pore size distribution of nanosheets (NSs).

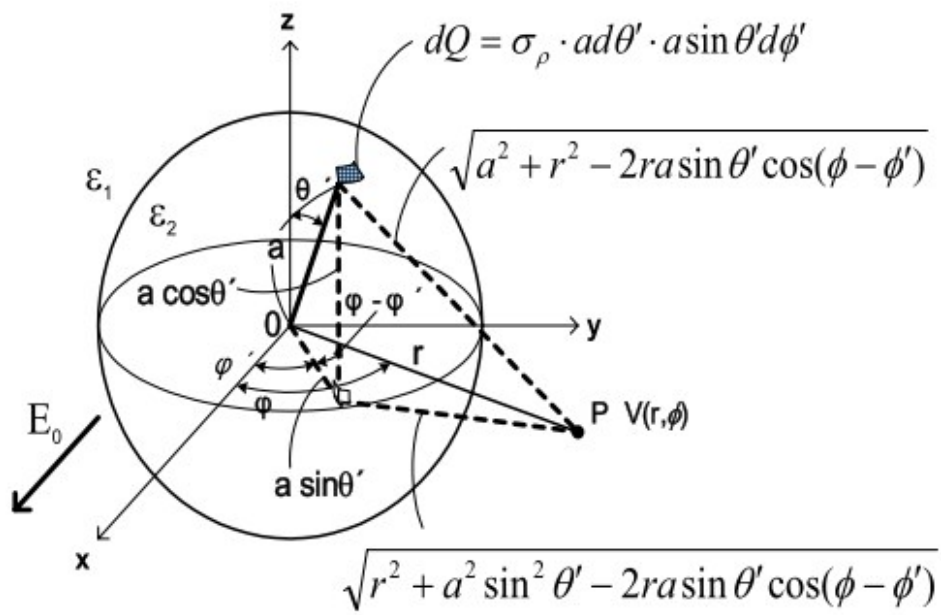Figure S2. Image of pure oil and 0.00wt% nanofluids after standing for three months

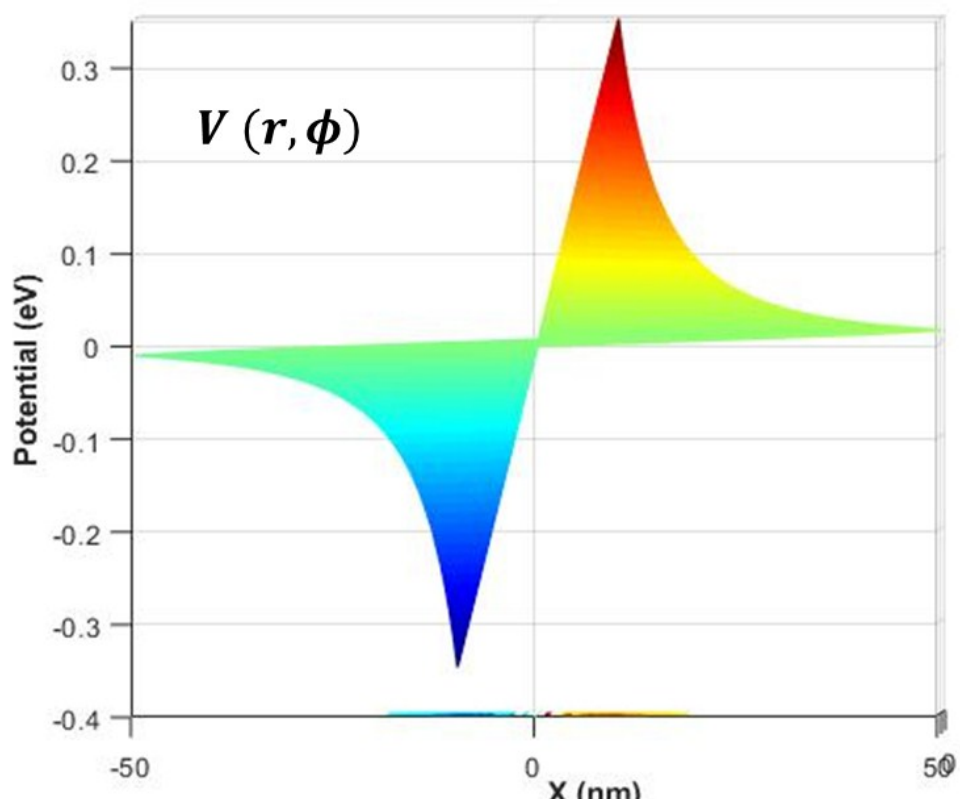Figure S3. the schematic diagram of spherical coordinate system.

Figure S4. Cross-sectional view of electric field potential distribution of NPs.
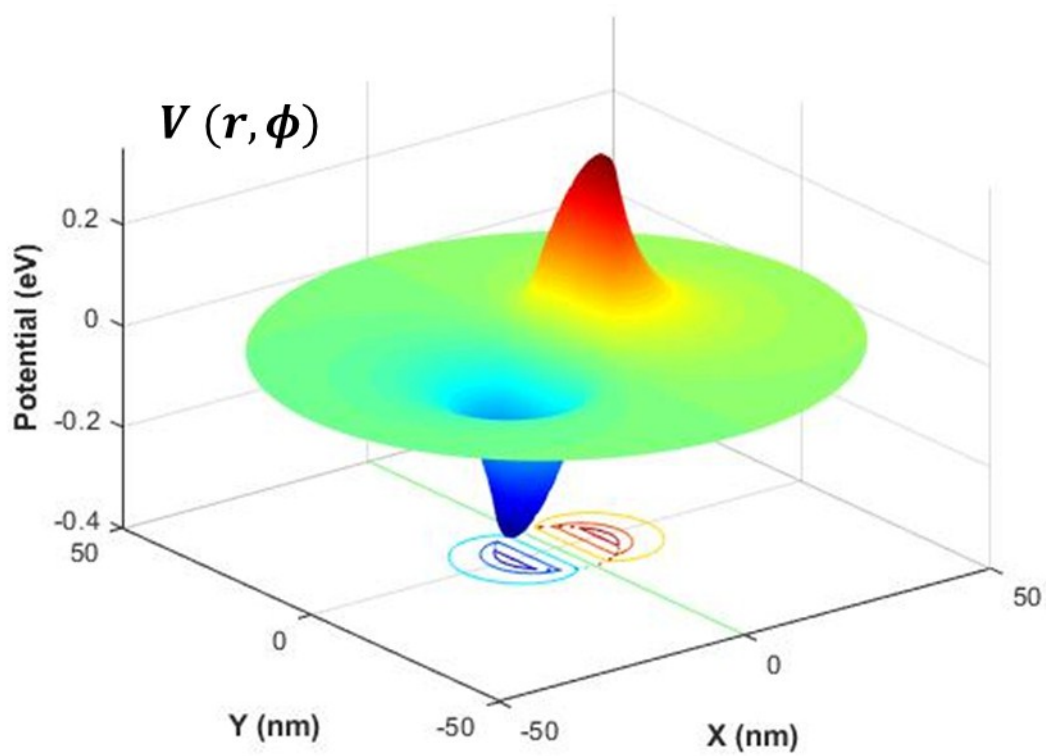
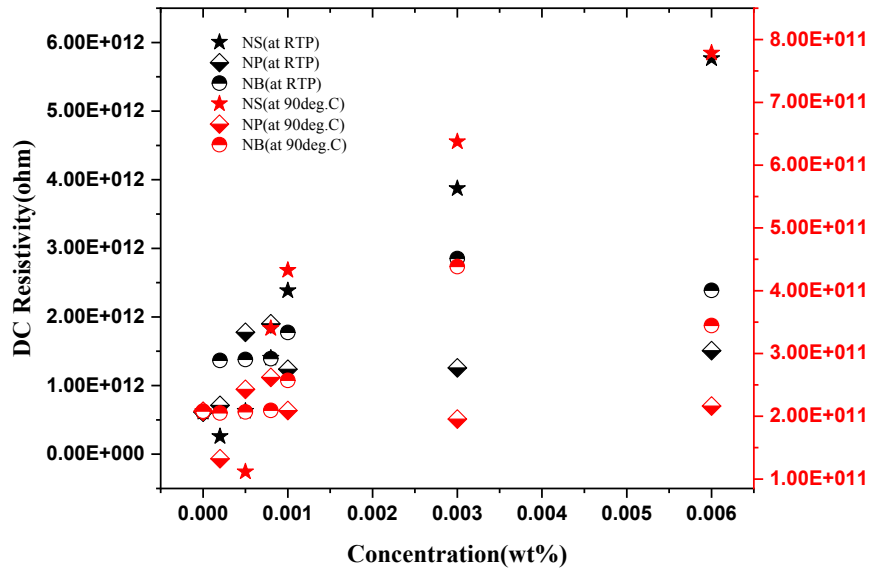Figure S5. 3D view of electric potential distribution of NPs

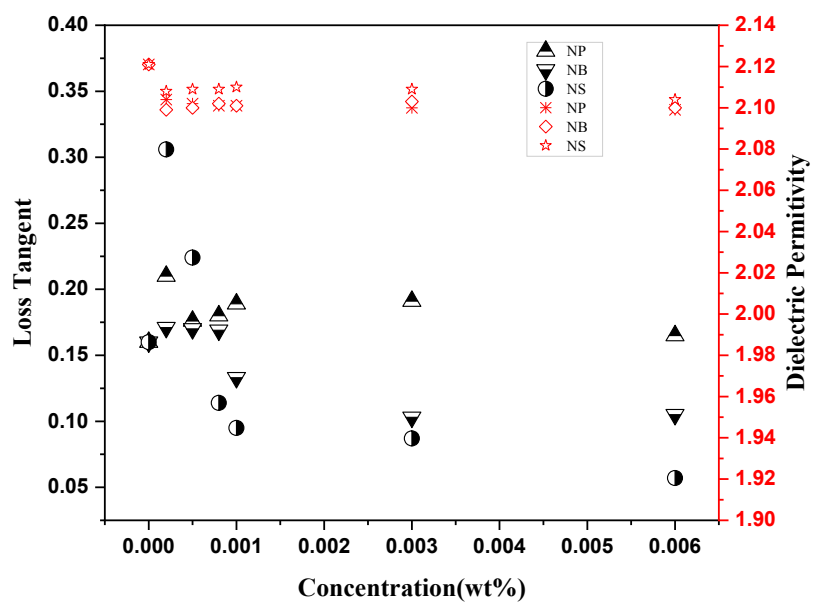Figure S6. The DC resistivity of MO and nanofluids at room temperature and 90℃

Figure S7. Image of DC loss tangent of pure oil, MO/NPs, MO/NBs, and MO/NPs with different concentrations

Table S1. The standard error of AC BDV of pure oil and nanofluids

Con	MO	MO/NPs	MO/NBs	MO/NSs
0.0002wt%	6.5160	3.7615	2.4054	4.5224
0.0005wt%	6.5160	2.8375	2.8152	4.2925
0.0008wt%	6.5160	2.4561	2.0955	4.1001
0.001wt%	6.5160	2.2075	4.2887	4.0865
0.003wt%	6.5160	3.4875	3.3017	4.1466
0.006wt%	6.5160	4.1986	3.5749	3.3269