Supporting Information

The determination of standard curve

Doing full wavelength scanning of solvent and sample, and the maximum peak was selected besides the solvent peak, and mark the wavelength corresponding maximum peak as λ_{max}. The oil solution with known concentration (0, 10, 20, 30, 40, 50 mg/L) was prepared and the absorbance of those solution was determined at λ_{max} and a standard curve of the absorbance corresponding to the oil concentration was made.

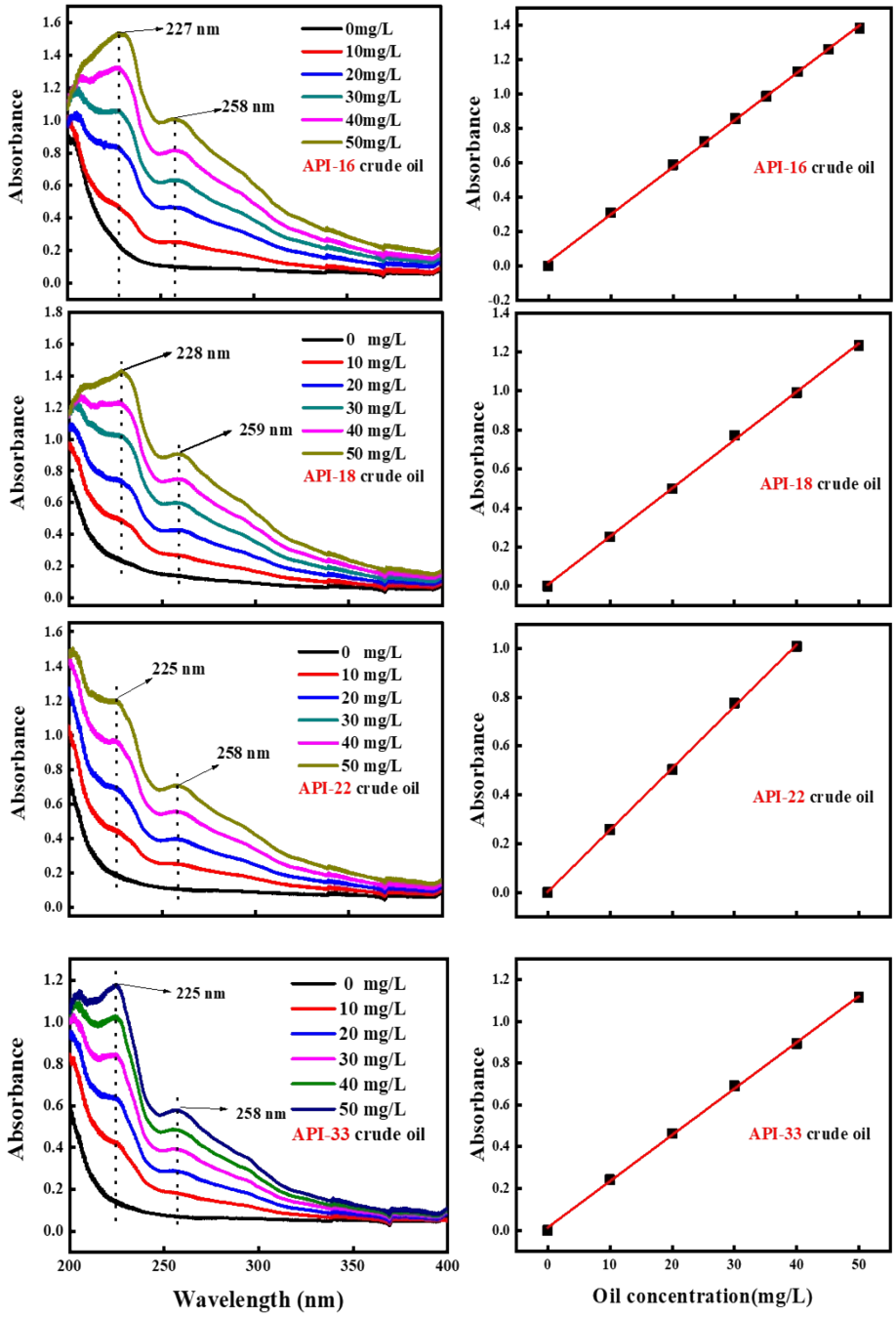


Fig. S1. Full-wavelength scanning picture and standard curves of four crude oil

SLY: Y=0.027X+0.024 (R^2=0.9991); S(1)

SJH: Y=0.025X+0.0064 (R^2=0.9991); S(2)

YYS: Y=0.025X+0.0022 (R^2=0.9994); S(3)

YYH: Y=0.022X+0.014 (R^2=0.9992). S(4)

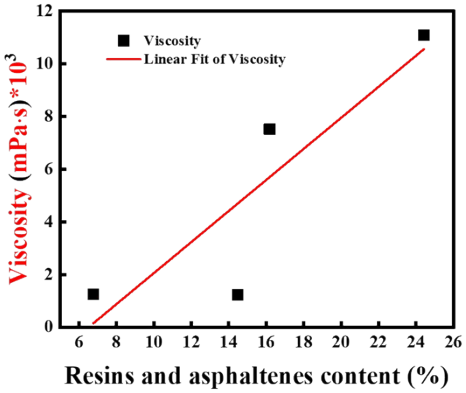


Fig. S2. The relation between crude oil viscosity and polar compounds.

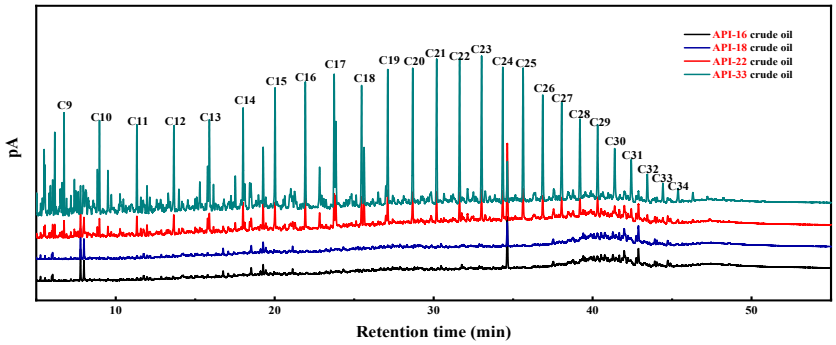


Fig. S3. GC-FID image of four types of crude oil

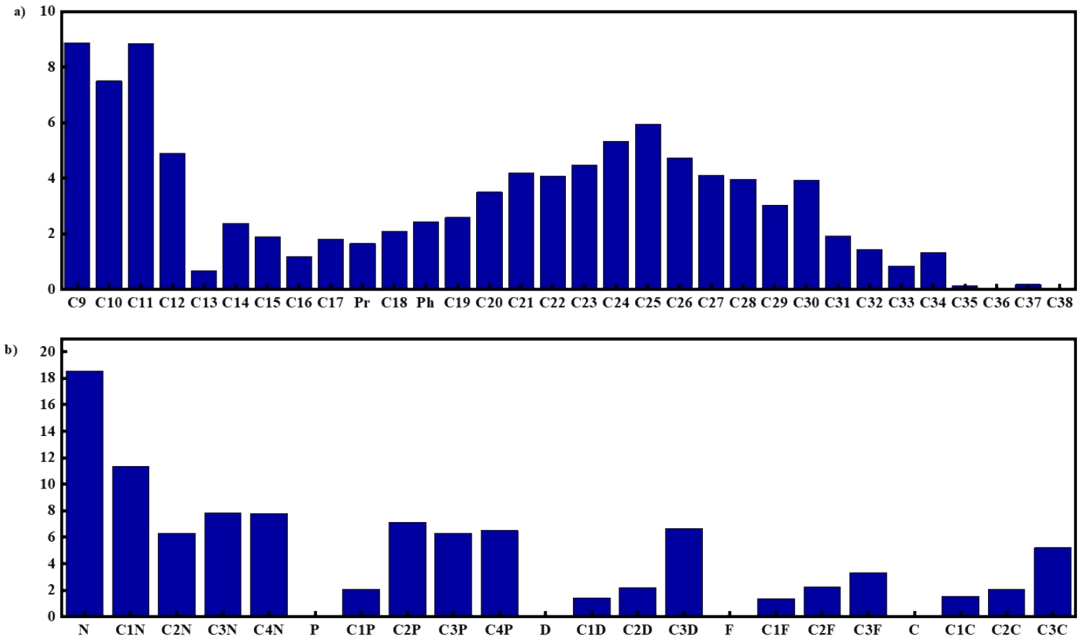


Fig. S4. a) The water phase percentage of total *n*-alkanes ranging from C9-C38 in relation to API-

22-OPAs

b) The water phase percentage of five targeted PAHs and their alkylated homologues in relation to API-22-OPAs

Table S1: Particulate matters information summary

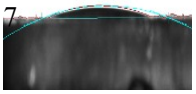
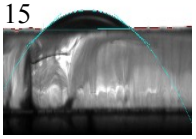
Name	Size(μm)	Zeta potential(mV)	Classification	Percentage	Contact angle(°)
 Kaolin	1-6	-22.7	-	-	7 
 Natural sediment	30.8-38.5	-18.3	30.8 μm 34.2 μm 36.2 μm 38.5 μm	1:1:1:1	15 
 Sand	154-212	too large to measure	154 μm 160 μm 180 μm 212 μm	1:1:1:1	too large to measure

Table S2. Characteristics of the chemical dispersant, Tween 80

Indices	Characteristics
Appearance	Amber, viscous liquid
pH	5-7
Flash point	>110ºC
Viscosity (under 25ºC)	400-600 mPa·s
Hydrophile-Lipophile balance number	15.0
Half lethal concentration in mice	7.5 mL/kg

$$TPH(\%) = Coil - OPAs \times V / Coil / Vadd \times 100\% \qquad S(5)$$

where $C_{oil\text{-}OPAs}$ was oil concentration in OPAs, mg/L; C_{oil} was the initial oil concentration, mg/L; V was volume of extraction liquid, mL; F was dilute factor; V_{add} was 50 mL.