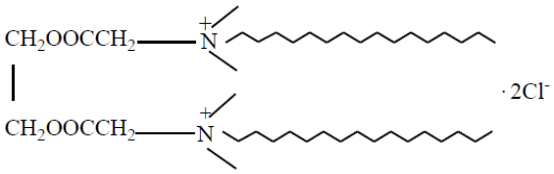
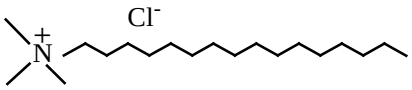
"Supplementary Information"



(16-E2-16)



(CTAC)

$CH_3(CH_2)_{15}C_5H_4N^+Cl^-$

(CPC)

$H_3C\text{-}(CH_2)_{11}\text{-}SO_3^-\ Na^+$

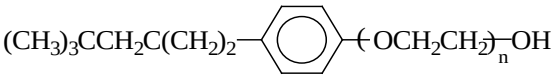
(SDS)

$CH_3\ (CH_2)_{11}C_6H_4SO_3^-Na^+$

(SDBS)

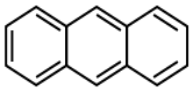
$H_3C\text{-}(CH_2)_{15}\text{-}(OCH_2CH_2)_{20}OH$

(Brij 58)

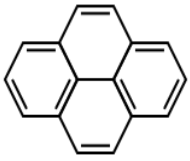


(TX-100)

Scheme S2. Structure of surfactant molecules used in this study: Ethane-1,2-diyl bis(*N*, *N*-dimethyl-*N*-hexadecylammoniumacetoxy) dichloride (16-E2-16), Hexadecyltrimethylammonium Chloride (CTAC), Cetylpyridinium Chloride (CPC), Sodium dodecyl sulfate (SDS), Sodium dodecyl benzene sulfonate (SDBS), Polyoxyethylene (20) cetyl ether (Brij 58), *t*-octylphenoxypolyethoxyethanol (TX-100)



Anthracene



Pyrene

Molecular weight:	178.2	202.3
Solubility (mol/L):	2.53×10^{-7}	6.57×10^{-7}
log $K_{OW:}$	4.54	5.18
Molar volume (Å^3):	157.6	161.9

Scheme S2. Structure and properties of polycyclic aromatic hydrocarbons

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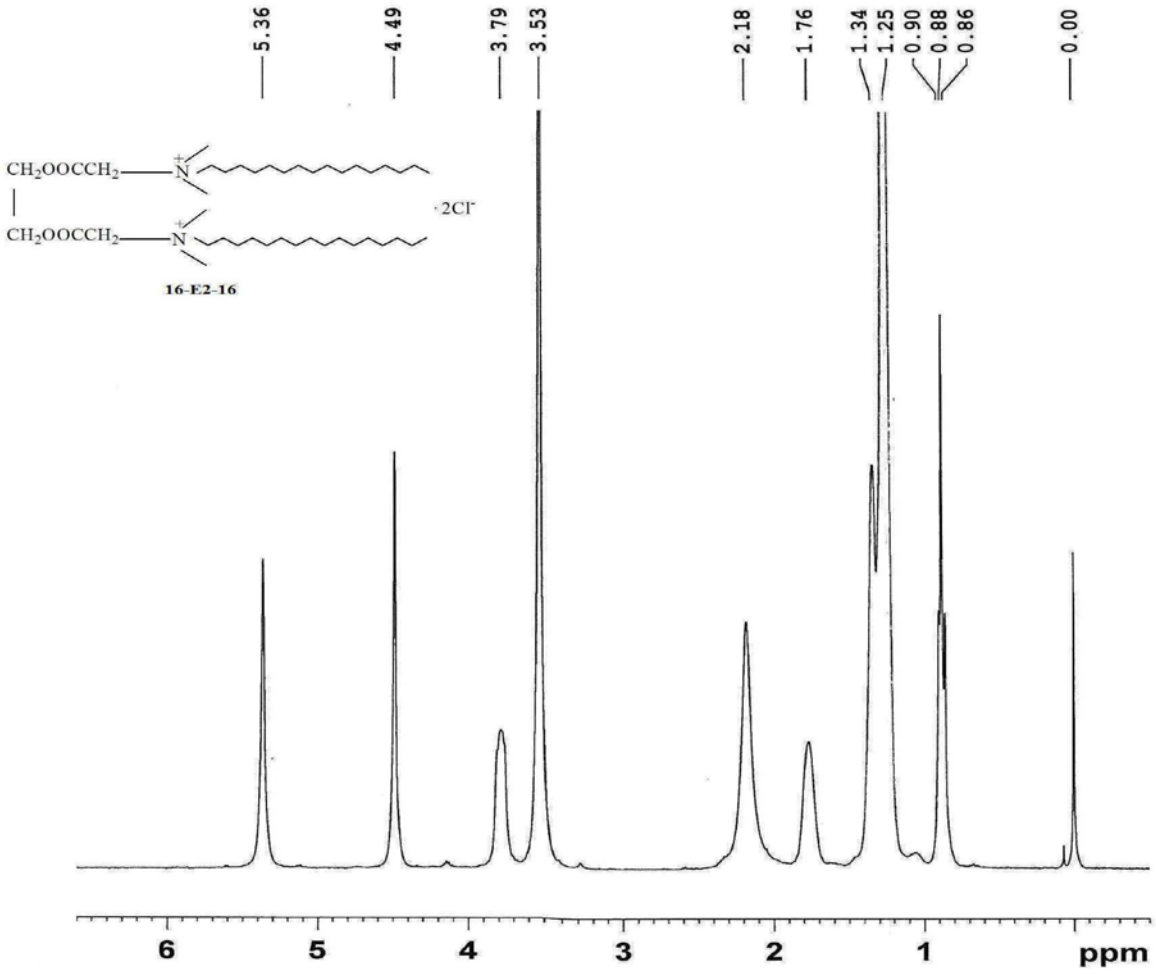

Fig. S1 (A). ^{1}H-NMR spectrum (300MHz) of Ethane-1,2-diyl bis(*N*,*N*-dimethyl-*N*-hexadecylammoniumacetoxy) dichloride (16-E2-16) in $CDCl_3$.

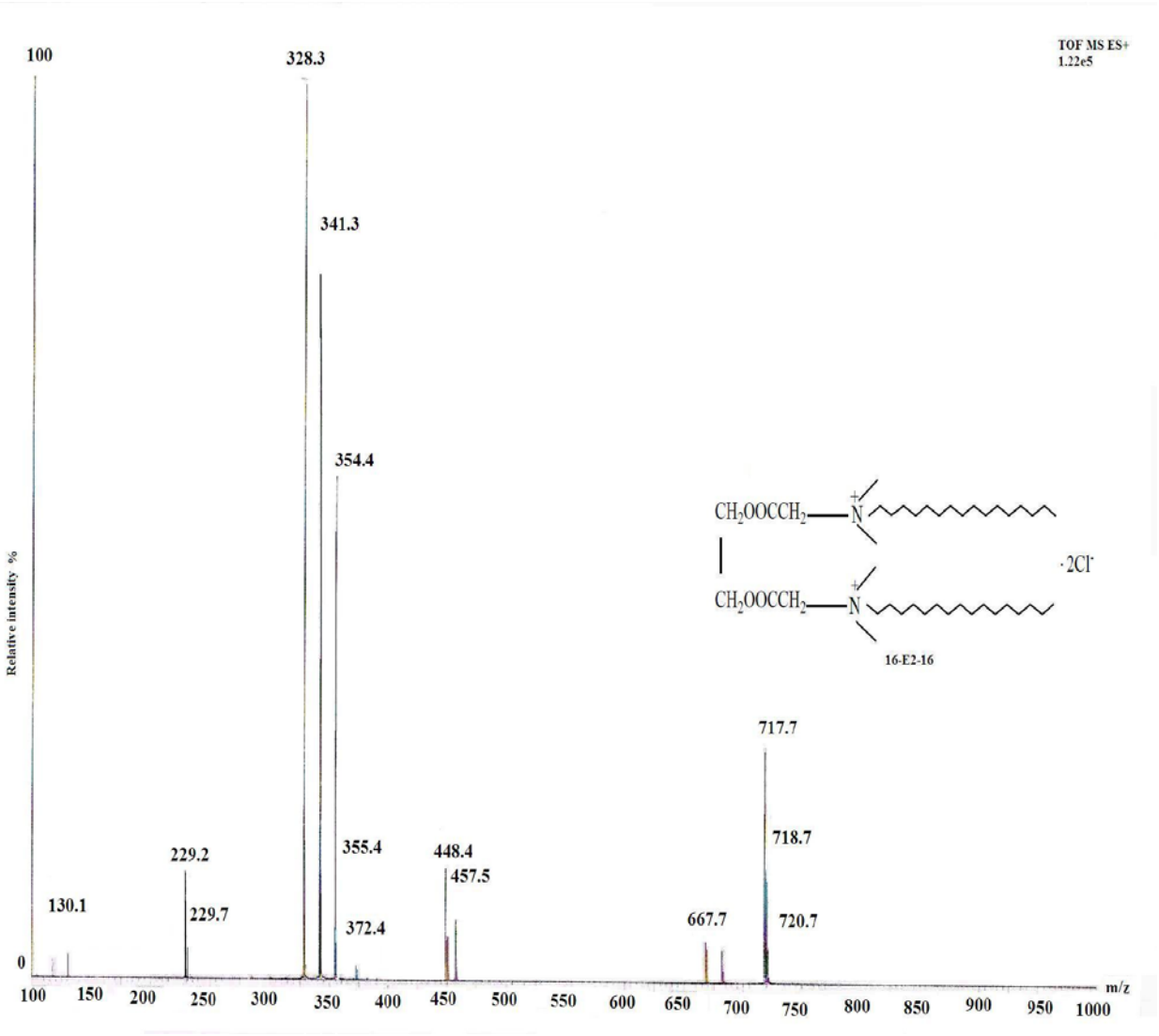

Fig. S1(B). MS-ESI (+) spectrum (relative intensity vs. m/z) of Ethane-1,2-diyl bis(*N*,*N* dimethyl-*N*- hexadecylammoniumacetoxy) dichloride (16-E2-16).

Table S1 Physicochemical parameters evaluated with the average conductometric and tensiometric cmc values determined at 30 °C

System	X_1^m	X_1^{ideal}	f_1^m	f_2^m	ΔG_{ex}^m ($kJmol^{-1}$)
16-E2-16					
CPC					
CTAC					
SDS					
SDBS					
Brij 58					
TX-100					
16-E2-16+CPC	0.7899	0.9983	0.6788	0.0041	-3.668
16-E2-16+ CTAC	0.7932	0.9988	0.6714	0.0028	-3.848
16-E2-16+SDS	0.8788	0.9998	0.8781	0.0010	-2.372
16-E2-16+SDBS	0.8742	0.9995	0.8869	0.0030	-2.100
16-E2-16+Brij 58	0.6856	0.7692	0.8931	0.5841	-0.621
16-E2-16+TX-100	0.7479	0.9923	0.6152	0.0139	-3.630

Table S2 The Solubilization parameters $\ln K_m$, ΔG_s^0, R and B for single and binary (1:1) surfactant systems

System	Anthracene				Pyrene			
	lnK_m	R	B	ΔG_s^0 ($kJmol^{-1}$)	lnK_m	R	B	ΔG_s^0 ($kJmol^{-1}$)
16-E2-16	12.64			-31.86	15.01			-37.83
CPC	12.67			-31.94	14.77			-37.22
CTAC	13.91			-35.07	14.55			-36.68
SDS	12.22			-30.80	12.77			-32.19
SDBS	12.01			-30.27	9.99			-25.20
Brij 58	14.86			-37.46	15.75			-39.71
TX-100	13.79			-34.77	13.92			-35.10
16-E2-16+CPC	14.80	4.30	15.41	-35.57	15.11	1.251	-0.52	-38.09
16-E2-16+CTAC	14.02	0.86	9.22	-33.58	14.11	0.486	-4.20	-35.56
16-E2-16+SDS	16.15	21.15	37.42	-39.02	15.36	2.560	17.38	-38.73
16-E2-16+SDBS	16.13	22.46	36.34	-39.98	15.61	3.627	40.62	-39.35
16-E2-16+Brij 58	15.43	1.61	12.34	-37.18	16.62	3.168	3.78	-41.91
16-E2-16+TX-100	14.05	0.978	7.99	-33.66	14.18	0.876	4.33	-35.74