BASIC DATA OF CHAPTER 4

Table 20. ^{1}H NMR data of Na_2AAS, $(C_{12}Mal)_2Ca_2$, $(C_{12}Asp)_2Ca_2$, $(C_{12}Glu)_2Ca_2$, $(C_{12}Mal)_2Mn_2$, $(C_{12}Asp)_2Mn_2$, $(C_{12}Glu)_2Mn_2$, $(C_{12}Mal)_2Cd_2$, $(C_{12}Asp)_2Cd_2$ and $(C_{12}Glu)_2Cd_2$ at 298K.

Compound	Terminal -(CH_3)	-$(CH_2)_7$ -	$^{\beta}CH_2$-	$^{\alpha}CH_2$-	CO-$^{\alpha}(CH_2)$-	-CO-CH_2-$^{\beta}(CH_2)$-	-NH-	-NH-$^{\alpha}(CH)$-	-NHCH-$^{\beta}(CH_2)$-	-NHCH$H_2^{\gamma}(CH_2)$-
$C_{12}MalNa_2$	0.86 (6H,s)	1.23 (32H, m)	1.98 (m, br, 2H, β)	4.94 (m, 2H, α)	2.54 (4H, t)	2.41(4H, t,t)	7.2 (1H, s)	4.75 (2H,d)		
$C_{12}AspNa_2$	0.87 (6H,s)	1.23 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.54 (4H, t)	2.41 (4H, t,t)	7.2 (1H, s)	4.75 (2H,d)		
$C_{12}GluNa_2$	0.87 (6H,s)	1.23 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.54 (4H, t)	2.41 (4H, t,t)	7.2 (1H, s)	4.75 (2H,d)		
$(C_{12}Mal)_2Cd_2$	0.87 (6H,s)	1.25 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.56 (4H, t)	2.43 (4H, t,t)	7.4 (1H,)s	4.8 (2H,d)		
$(C_{12}Asp)_2Cd_2$	0.88 (6H,s)	1.25 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.56 (4H, t)	2.43 (4H, t,t)	7.4 (1H, s)	4.8 (2H,d)	1.43(4H, d)	
$(C_{12}Glu)_2Cd_2$	0.89 (6H,s)	1.25 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.56 (4H, t)	2.43 (4H, t,t)	7.4 (1H, s)	4.8 (2H,d)	1.43 (4H, d)	1.23 (4H, t)
$(C_{12}Mal)_2Ca_2$	0.92 (6H,s)	1.28 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.58 (4H, t)	2.45 (4H, t,t)	7.5 (1H, s)	4.9 (2H,d)		
$(C_{12}Asp)_2Ca_2$	0.91 (6H,s)	1.28 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.58 (4H, t)	2.45 (4H, t,t)	7.5 (1H, s)	4.9 (2H,d)	1.44 (4H,d)	
$(C_{12}Glu)_2Ca_2$	0.9 (6H,s)	1.28 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.58 (4H, t)	2.45 (4H, t,t)	7.5 (1H, s)	4.9 (2H,d)	1.44 (4H,d)	1.23 (4H, t)
$(C_{12}Mal)_2Mn_2$	0.91 (6H,s)	1.3-1.5 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.6 (4H, t)	2.48 (4H, t,t)	7.8 (1H, s)	4.95 (2H,d)		
$(C_{12}Asp)_2Mn_2$	0.94 (6H,s)	1.3-1.5 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.6 (4H, t)	2.48 (4H, t,t)	7.8 (1H, s)	4.95 (2H,d)	1.46 (4H,d)	
$(C_{12}Glu)_2Mn_2$	0.96 (6H,s)	1.3-1.5 (32H, m)	1.98 (m, 2H, β)	4.94 (m, 2H, α)	2.6 (4H, t)	2.48 (4H, t,t)	7.8 (1H, s)	4.95 (2H,d)	1.46 (4H,d)	1.23 (4H,t)

Table 21. FTIR data of Na_2AAS and metallosurfactants.

System	-CH- symmetrical (1400- 1431)	-CH- asymmetrical (1486- 1553)	-CONH- stretching (1630-1690)	-CO- (1680-1750)	-COOH (1720-1820)	$-CH_2$ asymmetrical (2917), symmetrical (2849)	Free –NH- (3300-3500)
$C_{12}MalNa_2$	1428(s)	1502(w)	1556(w)	1620(s)	1728(s)	2923(s)	3377(s)
$C_{12}AspNa_2$	1408(s)	1487(w)	1572(s)	1719(s)	1786(w)	2907(s)	3348(s)
$C_{12}GluNa_2$	1428(s)	1535(s)	1630(s)	1670(s)	1719(w)	2889(s)	3406(s)
$(C_{12}Mal)_2Cd_2$	1334 (s)	1557(w)	1639(s)	1760(w)	1897(s)	2922(s)	3405(s)
$(C_{12}Asp)_2Cd_2$	1334 (w)	1580(s)	1717(s)	1795(w)	1865(s)	2922(s)	3450(s)
$(C_{12}Glu)_2Cd_2$	1469 (s)	1572(s)	1691(s)	1739(s)	1779(s)	2959(s)	3413(s)
$(C_{12}Mal)_2\ Ca_2$	1331(s)	1434(s)	1581(s)	1737(w)	1811(w)	2918(s)	3360(s)
$(C_{12}Asp)_2Ca_2$	1401(s)	1493(w)	1632(s)	1710(w)	1851(s)	2923(s)	3377(s)
$(C_{12}Glu)_2Ca_2$	1487(s)	1584(s)	1716(s)	1749(s)	1781(s)	2927(s)	3472(s)
$(C_{12}Mal)_2Mn_2$	1346(s)	1420(w)	1478(s)	1560(w)	1654(w)	2944(s)	3466(w)
$(C_{12}Asp)_2Mn_2$	1402(s)	1489(s)	1640(w)	1704(w)	1847(s)	2927(s)	3348(s)
$(C_{12}Glu)_2Mn_2$	1460(s)	1569(w)	1656(s)	1736(w)	1770(w)	2955(s)	3462(w)

Table 22. Lift-off area (A_0) and minimum molecular area (A_{min}) and collapse pressure (π_c), of different metallosurfactants+SPC mixed monolayer at 298K.

$\alpha_{(C_{12}AAS)_2M_2}$	A_o/ nm^{2}molecule^{-1}	A_{min}/ nm^{2}molecule^{-1}	π_c / mN m^{-1}
		$(C_{12}Mal)_2Cd_2$+SPC	
1.0	1.65	1.20	46.0
0.8	1.52	1.14	45.2
0.6	1.43	1.10	44.5
0.5	1.38	1.08	42.5
0.4	1.28	1.06	41.2
0.2	1.22	0.96	40.2
0.0	1.15	0.85	45.5
		$(C_{12}Asp)_2Cd_2$+SPC	
1.0	1.62	1.24	46.5
0.8	1.55	1.15	45.2
0.6	1.62	1.12	44.2
0.5	1.55	1.09	43.2
0.4	1.48	1.07	42.1
0.2	1.42	0.99	41.2
		$(C_{12}Glu)_2Cd_2$+SPC	
1.0	1.68	1.29	46.5
0.8	1.59	1.24	45.2
0.6	1.48	1.13	45.0
0.5	1.39	1.12	44.9
0.4	1.35	1.08	43.9
0.2	1.29	1.00	43.7
		$(C_{12}Mal)_2Ca_2$+SPC	
1.0	1.75	1.30	46.5
0.8	1.95	1.24	45.2
0.6	1.83	1.20	44.5
0.5	1.78	1.18	42.5
0.4	1.68	1.16	41.1
0.2	1.62	1.06	40.0
		$(C_{12}Asp)_2Ca_2$+SPC	
1.0	1.96	1.34	46.5
0.8	1.85	1.25	45.2
0.6	1.82	1.22	44.2
0.5	1.75	0.98	43.2
0.4	1.68	0.78	42.1
0.2	1.52	0.69	41.2

$\alpha_{(C_{12}AAS)_2M_2}$	A_o/ nm^{2}molecule^{-1}	A_{min}/ nm^{2}molecule^{-1}	π_c / mN m^{-1}
$(C_{12}Glu)_2Ca_2$+SPC			
1.0	1.98	1.39	46.5
0.8	1.89	1.14	45.2
0.6	1.88	1.13	45.0
0.5	1.69	1.02	44.9
0.4	1.54	0.88	43.9
0.2	1.49	0.75	43.7
$(C_{12}Mal)_2Mn_2$+SPC			
1.0	1.99	1.35	46.5
0.8	1.95	1.29	45.2
0.6	1.84	1.25	44.5
0.5	1.79	1.25	42.5
0.4	1.69	1.21	41.1
0.2	1.62	1.06	40.0
$(C_{12}Asp)_2Mn_2$+SPC			
1.0	1.96	1.34	46.5
0.8	1.85	1.25	45.2
0.6	1.82	1.22	44.2
0.5	1.75	0.98	43.2
0.4	1.68	0.78	42.1
0.2	1.52	0.69	41.2
$(C_{12}Glu)_2Mn_2$+SPC			
1.0	1.98	1.39	46.5
0.8	1.89	1.14	45.2
0.6	1.88	1.13	45.0
0.5	1.69	1.02	44.9
0.4	1.54	0.88	43.9
0.2	1.49	0.75	43.7

30 mol% cholesterol was used in each case.

Table 23. Lift-off area of $(C_{12}Mal)_2Cd_2$, SPC and $\alpha_{(C_{12}Cd)_2Mal_2}$ ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter ($I.P.$) and compression modulii (C_S^{-1}) of $(C_{12}Mal)_2Cd_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Cd)_2Mal_2}$	π /mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$(C_{12}Mal)_2Cd_2$	SPC	$(C_{12}Mal)Cd_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	165.4	115.0	185.0	155.3	29.68	0.19	0.04	-12.78	-13.38	37.10	1.378	10.0
	5	117.0	92.49	140.0	112.9	27.90	0.25	0.03	-13.78	-14.27	34.87	1.211	16.0
	10	102.0	81.89	115.0	97.97	17.02	0.18	0.04	-14.78	-15.67	21.27	7.65	23.0
0.8	15	93.00	73.74	100.0	89.14	10.85	0.13	0.54	-15.78	-16.52	13.56	4.21	27.0
	20	85.50	68.00	85.0	82.00	3.020	0.04	0.01	-17.78	-18.78	3.75	1.41	24.0
	25	82.50	62.30	73.8	78.46	-4.660	-0.06	-0.02	-18.78	-19.08	-5.82	-2.78	20.0
	30	79.50	58.20	64.0	75.24	-11.24	-0.15	-0.05	-19.78	-19.98	-14.05	-5.59	15.0
	35	75.50	55.00	54.0	71.40	-17.40	-0.25	-0.08	-23.78	-23.88	-21.75	-7.58	12.0
	0	165.4	115.0	173.0	145.2	27.76	0.19	0.038	-17.43	-18.63	92.53	3.68	19.0
	5	117.0	92.49	133.4	107.7	26.20	0.24	0.031	-17.43	-16.41	87.34	3.78	32.0
	10	102.0	81.89	111.4	93.95	17.44	0.18	0.087	-17.43	-17.21	58.14	2.16	42.0
	15	93.0	73.74	98.4	85.29	13.10	0.15	0.065	-17.43	-16.91	43.68	1.62	48.0
0.6	20	85.5	68.0	89.4	78.50	10.91	0.13	0.054	-17.43	-16.93	36.33	1.30	49.8
	25	82.5	62.3	80.5	74.42	6.080	0.08	0.030	-16.40	-17.03	20.26	7.42	46.5
	30	79.5	58.2	73.9	70.98	2.920	0.04	0.014	-17.43	-16.83	9.73	3.87	39.2
	35	75.5	55.0	67.4	67.3	0.100	0.02	0.501	-17.43	-16.93	0.33	0.01	26.2
	0	165.4	115.0	172.0	140.2	31.84	0.22	0.151	-17.30	-15.32	159.0	5.99	18.0
	5	117.0	92.49	129.0	104.7	24.25	0.23	0.121	-17.32	-15.04	121.2	3.46	31.0
	10	102.0	81.89	109.6	91.94	17.65	0.19	0.081	-17.32	-16.04	88.25	3.64	40.0
0.5	15	93.0	73.74	92.5	83.37	9.130	0.10	0.041	-17.32	-16.67	45.65	1.36	46.0
	20	85.5	68.0	80.3	76.75	3.550	0.04	0.017	-17.32	-16.57	17.75	6.21	48.0
	25	82.5	62.3	70.5	72.42	-1.92	-0.02	-0.091	-17.32	-17.82	-9.52	-3.50	45.0
	30	79.5	58.2	59.9	68.85	-8.95	-0.12	-0.440	-17.32	-17.07	-44.75	-1.98	37.0
	35	75.5	55.0	54.0	65.25	-11.25	-0.17	-0.056	-17.32	-17.57	-56.25	-2.17	25.0

0.4	0	165.4	115.2	168.2	135.	32.84	0.25	0.064	-67.43	-50.2	-46.3	8.82	20.0
	5	117.0	92.49	130.0	102.2	27.70	0.27	0.01	-16.46	-15.90	-47.79	7.44	37.0
	10	102.0	81.89	110.9	89.93	20.96	0.23	0.10	-17.43	-17.60	-57.24	5.63	50.0
	15	93.0	73.74	99.0	81.4	17.5	0.21	0.08	-16.43	-19.65	-31.67	4.46	56.0
	20	85.5	68.0	88.0	75.0	13.0	0.17	0.06	-17.40	-60.43	-97.5	3.70	57.0
	25	82.5	62.3	79.0	70.38	8.62	0.12	0.04	-16.43	-16.33	-64.65	2.26	54.0
	30	79.5	58.2	72.0	66.72	5.28	0.07	0.02	-16.43	-16.03	-39.6	1.34	47.5
	35	75.5	55.0	65.3	63.2	2.10	0.03	0.01	-16.43	-16.93	-15.75	5.52	34.0
0.2	0	165.4	115.0	148.0	125.0	22.92	0.18	0.03	-19.78	-15.18	-48.4	1.50	15.0
	5	117.0	92.49	110.6	97.39	13.20	0.10	0.06	-19.78	-13.74	-24.16	9.32	26.0
	10	102.0	81.89	92.7	85.91	6.78	0.07	0.03	-12.78	-15.84	-35.76	4.06	37.0
	15	93.0	73.74	81.2	77.59	3.60	0.04	0.01	-12.78	-11.74	-72.16	2.44	43.0
	20	85.5	68.0	72.3	71.51	0.84	0.01	0.04	-19.78	-15.78	-16.20	5.49	45.0
	25	82.5	62.3	65.8	66.34	-0.54	-0.09	-0.02	-19.78	-12.48	-10.80	-3.10	43.0
	30	79.5	58.2	59.0	62.46	-3.46	-0.05	-0.01	-19.78	-17.08	-69.20	-2.34	34.0
	35	75.5	55.0	55.0	59.14	-4.14	-0.06	-0.02	-12.74	-10.28	-82.00	-2.13	23.0

Table 24. Lift-off area of $Cd_2(Asp)_2$, SPC and $\alpha_{(C_{12}Cd)_2Asp_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter ($I.P.$) and compression modulii (C_S^{-1}) of $(C_{12}Asp)_2Cd_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Cd)_2Asp_2}$	π/mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$Cd_2(C_{12}Asp)_2$	SPC	$Cd_2(C_{12}Asp)_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	152.0	115.0	188.0	144.6	31.77	0.21	0.05	-12.74	-12.74	39.71	1.65	10.0
	5	126.5	92.49	146.3	119.6	26.30	0.21	0.13	-19.78	-11.27	32.87	1.43	16.0
	10	95.8	81.89	121.7	93.01	28.68	0.30	0.14	-19.78	-10.37	35.85	1.06	23.0
0.8	15	81.9	73.74	107.2	80.26	26.73	0.33	0.13	-12.78	-11.12	33.41	1.69	27.0
	20	75.5	68.2	94.8	74.12	20.84	0.28	0.10	-19.78	-15.78	26.04	9.92	24.0
	25	69.4	62.3	84.3	67.66	16.64	0.24	0.83	-19.78	-15.58	20.82	7.45	20.0
	30	63.8	58.2	75.2	62.68	12.32	0.19	0.61	-12.78	-17.18	15.4	5.98	15.0
	35	56.1	55.4	67.2	55.8	11.24	0.20	0.05	-13.78	-13.78	14.2	5.80	12.0
	0	152.1	115.1	177.0	137.2	22.72	0.16	0.11	-17.43	-14.44	75.75	27.31	19.0
	5	126.5	92.49	132.6	112.8	19.70	0.17	0.09	-17.43	-15.91	65.68	23.17	32.0
	10	95.8	81.89	111.4	90.23	21.16	0.23	0.10	-16.43	-15.61	70.54	25.61	42.0
	15	81.9	73.74	99.2	78.63	20.56	0.26	0.10	-16.43	-15.61	68.54	24.92	48.0
0.6	20	75.5	68.00	89.4	72.50	16.90	0.23	0.08	-16.43	-15.93	56.33	20.16	49.8
	25	69.2	62.30	80.5	66.32	14.18	0.21	0.07	-16.43	-15.53	47.26	1.18	46.5
	30	63.8	58.20	73.2	61.56	11.44	0.18	0.05	-16.43	-16.23	38.13	1.81	39.2
	35	56.2	55.20	66.6	55.62	11.21	0.19	0.05	-16.43	-16.43	36.66	1.24	26.2
	0	152.2	115.2	169.0	133.5	14.34	0.10	0.07	-17.32	-15.82	71.72	2.78	18.0
	5	126.5	92.49	134.0	109.4	20.72	0.18	0.10	-17.32	-14.79	103.6	3.58	31.0
	10	95.8	81.89	111.4	88.84	18.47	0.20	0.09	-17.32	-16.54	92.38	3.19	40.0
	15	81.9	73.74	98.40	77.82	11.82	0.15	0.05	-17.32	-14.42	59.14	2.10	46.0

0.5	20	75.5	68.00	87.00	71.75	7.06	0.09	0.03	-17.32	-16.07	35.34	12.03	48.0
	25	69.0	62.30	77.00	65.65	1.43	0.02	0.07	-17.32	-16.57	7.17	2.02	45.0
	30	63.8	58.20	69.90	61.02	-3.6	-0.05	-0.01	-17.32	-16.82	-18.20	-6.37	37.0
	35	56.0	55.00	62.50	55.51	-9.05	-0.16	-0.04	-17.31	-16.32	-45.25	-1.14	25.0
0.4	0	152.2	115.2	150.9	129.8	13.27	0.102	0.06	-16.42	-11.93	99.57	1.10	20.0
	5	126.5	92.49	116.4	106.0	10.30	0.09	0.05	-16.24	-16.90	77.29	2.49	37.0
	10	95.8	81.89	98.5	87.45	11.02	0.12	0.05	-16.43	-16.20	82.84	2.42	50.0
	15	81.9	73.74	86.3	77.04	9.29	0.12	0.04	-17.43	-10.95	69.72	2.98	56.0
	20	75.5	68.0	77.3	71.00	6.3	0.08	0.03	-17.43	-15.93	47.25	1.58	57.0
	25	69.0	62.3	70.2	64.98	5.02	0.07	0.02	-16.43	-16.33	37.65	1.49	54.0
	30	63.8	58.2	63.5	60.44	3.06	0.05	0.01	-17.43	-16.13	22.95	8.60	47.5
	35	56.0	55.0	58.6	55.40	3.22	0.05	0.01	-17.43	-16.43	24.20	8.23	34.0
0.2	0	152.0	115.0	115.0	122.4	-7.40	-0.06	-0.03	-19.78	-19.78	-148.0	152	15.0
	5	126.5	92.49	92.3	99.29	-6.99	-0.07	-0.03	-19.78	-19.84	-19.84	1.52	26.0
	10	95.8	81.89	83.6	84.67	-1.07	-0.01	-0.05	-19.78	-19.79	-21.44	0.98	37.0
	15	81.9	73.74	77.4	75.37	2.02	0.02	0.01	-19.78	-19.79	40.56	0.81	43.0
	20	75.5	68.0	72.1	69.50	2.60	0.03	0.01	-19.78	-20.78	52.00	0.75	45.0
	25	69.0	62.3	67.8	63.64	4.16	0.06	0.02	-17.78	-18.98	83.21	0.69	43.0
	30	63.8	58.2	65.0	59.32	5.68	0.09	0.02	-19.78	-20.38	113.6	0.63	34.0
	35	56.0	55.0	62.5	55.20	7.30	0.13	0.03	-19.78	-19.88	146.0	56.0	23.0

Table 25. Lift-off area of $(C_{12}Glu)_2Cd_2$, SPC and $\alpha_{(C_{12}Cd)_2Glu_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter (*I.P.*) and compression modulii (C_S^{-1}) of $(C_{12}Glu)_2Cd_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Cd)_2Glu_2}$	Pressure / mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$(C_{12}Glu)_2Cd_2$	SPC	$(C_{12}Glu)_2Cd_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	192.0	115.0	201.0	176.6	24.41	0.13	0.12	-12.78	-11.78	30.5	1.09	10.0
	5	125.0	92.49	146.4	118.4	27.90	0.23	0.13	-12.78	-11.27	34.87	1.24	16.0
	10	106.0	81.89	120.0	101.1	18.82	0.18	0.09	-12.78	-11.67	23.52	0.84	23.0
0.8	15	96.9	73.74	103.0	92.26	10.73	0.11	0.05	-12.78	-16.12	13.41	0.48	27.0
	20	91.8	68.0	88.6	87.04	1.56	0.01	0.07	-12.78	-12.98	1.95	0.06	24.0
	25	89.8	62.3	76.3	84.3	-8.00	-0.09	-0.04	-19.78	-12.78	-10.2	-0.35	20.0
	30	87.8	58.2	67.4	81.88	-14.48	-0.17	-0.07	-19.78	-13.18	-18.1	-0.68	15.0
	35	85.7	55.0	58.4	79.56	-21.16	-0.26	-0.01	-12.39	-13.58	-26.45	-0.94	12.0
	0	192.0	115.0	190	161.2	28.8	0.17	0.14	-17.43	-13.43	96.00	3.4	19.0
	5	125.0	92.49	136.5	111.9	24.50	0.21	0.12	-17.44	-15.91	81.68	2.92	32.0
	10	106.0	81.89	108.8	96.35	12.44	0.12	0.06	-17.43	-16.21	41.48	1.48	42.0
	15	96.9	73.74	92.4	87.63	4.764	0.05	0.02	-17.43	-16.61	15.88	5.69	48.0
0.6	20	91.8	68.0	78.7	82.28	-3.58	-0.02	-0.01	-17.43	-16.33	-11.93	-4.27	49.8
	25	89.8	62.3	66.0	78.8	-12.8	-0.16	-0.06	-17.43	-17.45	-42.66	-1.52	46.5
	30	87.8	58.2	56.7	75.96	-19.26	-0.25	-0.09	-17.43	-17.73	-64.21	-2.32	39.2
	35	85.7	55.0	48.5	73.42	-24.92	-0.33	-0.12	-17.43	-17.03	-83.06	-2.97	26.2
	0	192.0	115.0	186	153.5	32.5	0.21	0.16	-17.32	-15.82	162.5	5.51	18.0
	5	125.0	92.49	138.3	108.7	29.55	0.27	0.14	-17.32	-15.69	14.77	5.29	31.0
	10	106.0	81.89	104.9	93.94	10.95	0.11	0.05	-17.32	-16.54	54.77	1.96	40.0
	15	96.9	73.74	87.7	85.32	2.38	0.02	0.01	-17.32	-17.42	11.90	4.26	46.0

0.5	20	91.8	68.0	73.9	79.9	-6.04	-0.07	-0.03	-17.32	-17.32	-30.01	-1.12	48.0
	25	89.8	62.3	61.5	76.05	-14.55	-0.19	-0.07	-17.32	-17.07	-72.75	-2.58	45.0
	30	87.8	58.2	53.0	73.0	-20	-0.27	-0.10	-17.35	17.32	-100.0	-3.31	37.0
	35	85.7	55.0	45.2	70.35	-25.15	-0.35	-0.12	-17.30	-18.43	-15.75	-4.27	25.0
0.4	0	192.0	115.0	180.0	145.8	34.2	0.23	0.171	-16.43	-14.43	256.5	9.76	20.0
	5	125.0	92.49	134.0	105.4	28.50	0.27	0.142	-17.43	-15.90	213.7	7.66	37.0
	10	106.0	81.89	115.5	91.53	23.9	0.26	0.119	-16.43	-15.60	179.7	6.44	50.0
	15	96.9	73.74	104.0	83.00	20.99	0.25	0.010	-16.43	-15.45	157.4	5.64	56.0
	20	91.8	68.0	95.0	77.52	17.48	0.22	0.087	-16.41	-15.03	131.1	4.69	57.0
	25	89.8	62.3	86.0	73.3	12.7	0.14	0.063	-16.43	-16.93	95.25	3.41	54.0
	30	87.8	58.2	78.8	70.04	8.76	0.12	0.040	-16.43	-16.63	65.71	2.35	47.5
	35	85.7	55.0	73.0	67.28	5.72	0.08	0.028	-16.43	-16.81	42.95	1.53	34.0
0.2	0	192	115.0	173.0	130.4	42.6	0.326	0.213	-12.78	-10.78	851.0	3.05	15.0
	5	125	92.49	132.6	98.99	33.60	0.33	0.168	-12.78	-10.74	672.1	2.40	26.0
	10	106	81.89	111.4	86.71	24.68	0.28	0.123	-12.78	-11.34	493.7	1.76	37.0
	15	96.9	73.74	99.2	78.37	20.82	0.26	0.104	-12.78	-11.64	416.5	1.49	43.0
	20	91.8	68.0	89.4	72.76	16.64	0.22	0.083	-12.78	-11.58	332.8	1.19	45.0
	25	89.8	62.3	80.5	67.8	12.7	0.18	0.063	-12.78	-11.28	254.0	9.10	43.0
	30	87.8	58.2	73.06	64.12	8.94	0.13	0.044	-12.78	-11.08	178.8	6.42	34.0
	35	85.7	55	66.6	61.14	5.46	0.08	0.027	-12.78	-12.4	109.2	3.07	23.0

Table 26. Lift-off area of $(C_{12}Mal)_2Ca_2$, SPC and $\alpha_{(C_{12}Ca)_2Mal_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter ($I.P.$) and compression modulii (C_S^{-1}) of $(C_{12}Mal)_2Ca_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Ca)_2Mal_2}$	Pressure / mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$Ca_2(C_{12}Mal)_2$	SPC	$Ca_2(C_{12}Mal)_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	199	115.0	183.0	182.2	0.80	0.004	0.040	-12.78	-12.68	1.02	0.03	10.0
	5	143	92.49	133.0	132.8	0.100	7.670	0.510	-12.78	-12.79	0.127	0.04	16.0
	10	120	81.89	101.0	112.3	-11.37	-0.10	-56.89	-12.78	-12.28	-14.22	-0.50	23.0
0.8	15	113	73.74	85.0	105.1	-20.14	-0.19	-0.100	-12.78	-12.79	-25.18	-0.92	27.0
	20	112	68.00	73.6	103.2	-29.6	-0.28	-0.148	-12.78	-13.68	-37.00	-1.19	24.0
	25	104	62.30	64.7	95.66	-30.96	-0.32	-0.154	-1.74	-1.48	-38.70	-1.13	20.0
	30	95	58.20	57.0	87.64	-30.64	-0.34	-0.153	-1.78	-1.98	-38.30	-1.79	15.0
	35	92	55.00	51.7	84.6	-32.90	-0.38	-0.164	-12.78	-14.28	-41.10	-1.04	12.0
	0	199	115.0	181.0	165.4	15.6	0.09	78.00	-16.43	-16.83	52.0	0.01	10.0
	5	143	92.49	147.5	122.7	24.70	0.20	123.52	-16.43	-16.13	82.34	0.02	16.0
	10	120	81.89	125.5	104.7	20.74	0.19	103.72	-16.43	-16.43	69.14	2.43	42.0
	15	113	73.74	108.4	97.29	11.10	0.11	0.055	-17.43	-16.51	37.01	1.67	48.0
0.6	20	112	68.0	97.0	94.40	2.60	0.02	0.013	-16.43	-16.43	8.66	3.64	49.8
	25	104	62.3	85.6	87.32	-1.72	-0.01	-0.008	-16.43	-16.03	-5.73	-2.50	46.5
	30	95	58.2	78.3	80.28	-1.98	-0.02	-0.009	-16.42	-16.33	-6.60	-2.56	39.2
	35	92	55.0	70.9	77.20	-6.30	-0.08	-0.03	-16.43	-16.90	-21.0	-0.75	26.2
	0	199	115.0	153.0	157	-4.00	-0.02	-0.020	-17.32	-17.37	-20.0	-0.71	18.0
	5	143	92.49	121.7	117.7	3.95	0.03	0.019	-17.32	-16.97	19.77	0.70	31.0
	10	120	81.89	105.9	100.9	4.95	0.04	0.024	-17.32	-16.92	24.77	0.88	40.0

	15	113	73.74	95.4	93.37	2.03	0.02	0.010	-17.32	-17.07	10.15	0.36	46.0
	20	112	68.0	87.0	90	-3.00	-0.03	-0.015	-17.3	-17.32	-15.00	-0.53	48.0
	25	104	62.3	78.8	83.15	-7.18	-0.08	-0.035	-17.32	-17.39	-35.99	-1.29	45.0
	30	95	58.2	73.6	76.6	-5.13	-0.06	-0.025	-17.32	-17.37	-25.68	-0.92	37.0
	35	92	55.0	69.0	73.5	-9.24	-0.12	-0.046	-17.32	-17.34	-46.20	-1.22	25.0
	0	199	115.0	141.0	148.6	-7.6	-0.051	-38.02	-16.43	-17.4	-57.02	-2.04	20.0
	5	143	92.49	111.2	112.6	-1.49	-0.01	-7.47	-16.43	-16.9	-11.20	-0.40	37.0
	10	120	81.89	96.3	97.13	-0.83	-0.002	-4.17	-16.43	-16.60	-6.25	-0.22	50.0
	15	113	73.74	85.8	89.44	-3.64	-0.04	-18.22	-16.43	-16.65	-27.33	-0.97	56.0
0.4	20	112	68.0	78.7	85.6	-6.90	-0.08	-34.50	-16.43	-17.93	-51.75	-1.85	57.0
	25	104	62.3	71.2	78.98	-7.78	-0.09	-38.91	-16.43	-17.33	-58.35	-2.09	54.0
	30	95	58.2	64.7	72.92	-8.22	-0.11	-41.11	-16.43	-17.53	-61.65	-2.20	47.5
	35	92	55.0	61.2	69.8	-8.61	-0.12	-43.02	-16.43	-17.43	-64.5	-2.31	34.0
	0	199	115.0	130.0	131.8	-1.80	-0.01	-0.09	-12.78	-12.48	-36.0	-1.29	15.0
	5	143	92.49	104.9	102.5	2.30	0.02	0.01	-12.78	-12.24	46.16	1.65	26.0
	10	120	81.89	92.7	89.51	3.18	0.03	0.01	-12.78	-12.84	63.76	2.28	37.0
	15	113	73.74	86.0	81.59	4.40	0.05	0.02	-12.78	-12.74	88.16	3.15	43.0
0.2	20	112	68.0	78.0	76.8	1.20	0.01	0.00	-12.78	-12.70	24.0	0.86	45.0
	25	104	62.3	73.0	70.64	2.36	0.03	0.01	-12.78	-12.98	47.2	0.01	43.0
	30	95.0	58.2	68.0	65.56	2.44	0.03	0.01	-12.78	-12.58	48.8	0.01	34.0
	35	92.0	55.0	63.3	62.40	0.90	0.01	0.00	-12.78	-15.28	18.0	0.64	23.0

Table 27. Lift-off area of $(C_{12}Asp)_2Ca_2$, SPC and $\alpha_{(C_{12}Ca)_2Asp_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter ($I.P.$) and compression modulii (C_S^{-1}) of $(C_{12}Asp)_2Ca_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Ca)_2Asp_2}$	π/mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$(C_{12}Asp)_2Ca_2$	SPC	$Ca_2(C_{12}Asp)_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	201	115.0	200.0	183.8	9.41	0.05	0.04	-12.78	-11.78	11.76	0.42	10.0
	5	164	92.49	145.6	149.6	-4.09	-0.027	-0.02	-12.78	-12.27	-5.12	-0.18	16.0
	10	138	81.89	122.0	126.7	-4.77	-0.037	-0.02	-12.78	-12.67	-5.97	-0.21	23.0
0.8	15	122	73.74	106.5	112.3	-5.84	-0.05	-0.02	-12.78	-12.02	-7.31	-0.26	27.0
	20	111	68.00	95.0	102.4	-7.4	-0.07	-0.03	-12.78	-12.78	-9.25	-0.33	24.0
	25	91.9	62.30	83.7	85.98	-2.28	-0.02	-0.01	-12.78	-12.18	-2.85	-0.10	20.0
	30	70.9	58.20	74.7	68.36	6.34	0.09	0.03	-12.78	-12.08	7.925	0.28	15.0
	35	63.8	55.00	67.4	62.04	5.36	0.08	0.81	-12.78	-12.9	6.71	0.24	12.0
	0	201	115.0	200	166.6	0.57	0.004	0.002	-16.43	-15.43	1.90	6.11	10.0
	5	164	92.49	133.4	135.3	-1.99	-0.01	-0.009	-16.43	-16.41	-6.62	-0.23	16.0
	10	138	81.89	101.4	115.5	-14.15	-0.12	-0.07	-16.43	-1712.	-47.18	-1.96	42.0
	15	122	73.74	85.0	102.6	-17.65	-0.17	-0.08	-16.43	-17.91	-58.98	-2.11	48.0
0.6	20	111	68.0	63.9	80.06	-16.16	-0.21	-0.10	-16.43	-17.93	-67.02	-1.24	49.8
	25	91.9	62.3	59.2	70.20	-14.22	-0.20	-0.08	-16.43	-17.23	-53.86	-0.23	46.5
	30	70.9	58.2	57.3	65.82	-8.52	-0.12	-0.04	-16.43	-16.03	-28.4	-1.01	39.2
	35	63.8	55	51.6	60.28	-8.68	-0.14	-0.04	-16.43	-17.8	-28.93	-1.03	26.2
	0	201	115	174	158	8.99	0.056	0.044	-17.32	-16.32	44.90	1.61	18.0
	5	164	92.49	133.4	128.2	5.155	0.04	0.025	-17.32	-16.54	25.77	0.92	31.0
	10	138	81.89	111.4	109.9	1.455	0.013	0.007	-17.32	-17.10	7.27	0.26	40.0
0.5	15	122	73.74	98.3	97.87	0.43	0.004	0.002	-17.32	-17.17	2.15	0.07	46.0

	20	111	68.0	86.9	89.5	-2.6	-0.02	-0.01	-17.32	-17.30	-13.0	-0.46	48.0
	25	91.9	62.3	77.0	77.1	-0.1	-0.001	-0.51	-17.32	-17.82	-0.50	-17.92	45.0
	30	70.9	58.2	69.9	64.55	5.35	0.082	0.026	-17.30	-16.57	26.75	95.80	37.0
	35	63.8	55	63.3	59.4	3.90	0.065	0.019	-17.32	-16.8	19.50	69.94	25.0
	0	201	115	165	149.4	12.10	0.080	0.060	-16.59	-15.59	90.79	32.29	20.0
	5	164	92.49	128.4	121.0	7.306	0.060	0.036	-16.59	-16.06	54.79	19.02	37.0
	10	138	81.89	107.1	104.3	2.766	0.020	0.013	-16.59	-16.7	20.74	743.56	50.0
	15	122	73.74	90.9	93.04	-2.14	-0.023	-0.010	-16.59	-16.3	-16.08	-5.35	56.0
0.4	20	111	68.0	77.9	85.2	-7.30	-0.08	-0.036	-16.59	-17.02	-54.75	-1.41	57.0
	25	91.9	62.3	70.5	74.14	-3.64	-0.04	-0.018	-16.59	-16.85	-27.30	-0.97	54.0
	30	70.9	58.2	64.8	63.28	1.52	0.024	0.007	-16.59	-16.50	11.40	0.40	47.5
	35	63.8	55.0	55.0	58.52	-3.52	-0.06	-0.017	-16.50	-16.81	-26.40	-0.94	34.0
	0	201	115	156	132.2	13.72	0.10	0.068	-12.78	-11.78	27.4	98.99	15.0
	5	164	92.49	116.7	106.7	9.90	0.09	0.049	-12.78	-11.24	19.16	71.67	26.0
	10	138	81.89	97.9	93.11	4.78	0.05	0.023	-12.78	-12.84	95.76	34.34	37.0
	15	122	73.74	86.6	83.44	3.20	0.03	0.016	-12.7	-12.23	64.16	2.29	43.0
0.2	20	111	68.0	77.6	76.6	1.02	0.01	0.005	-12.39	-12.34	20.0	0.71	45.0
	25	91.9	62.3	70.2	68.22	1.98	0.02	0.009	-12.39	-12.29	39.6	1.41	43.0
	30	70.9	58.2	62.9	60.74	2.16	0.03	0.010	-12.39	-12.28	43.2	1.54	34.0
	35	63.8	55.0	57.0	56.76	0.24	0.01	0.001	-12.78	-12.38	4.80	0.17	23.0

Table 28. Lift-off area of $Ca_2(Glu)_2$, SPC and $\alpha_{(C_{12}Ca)_2Glu_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter (*I.P.*) and compression modulii (C_S^{-1}) of $(C_{12}Glu)_2Ca_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Ca)_2Glu_2}$	π/mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$(C_{12}Glu)_2Ca_2$	SPC	$(C_{12}Glu)_2Ca_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	217.0	115.0	203.0	196.6	15.05	0.0	0.07	-12.78	-11.08	18.82	0.67	10.0
	5	142.8	92.49	151.5	132.7	18.76	0.14	0.09	-12.78	-11.97	23.45	0.84	16.0
	10	111.2	81.89	125.0	105.3	19.66	0.18	0.09	-12.78	-11.47	24.57	0.88	23.0
0.8	15	88.6	73.74	109.4	85.62	23.77	0.27	0.11	-12.78	-11.92	29.71	1.06	27.0
	20	68.3	68.0	95.0	68.24	26.76	0.3	0.13	-12.7	-11.48	33.45	1.19	24.0
	25	57.0	62.3	83.8	58.06	25.74	0.44	0.12	-12.78	-11.18	32.17	1.15	20.0
	30	48.0	58.2	72.5	50.04	22.46	0.44	0.11	-12.78	-11.48	28.07	1.00	15.0
	35	45.0	55.0	63.5	47.0	16.5	0.35	0.08	-12.78	-11.28	20.62	0.73	12.0
	0	217	115.0	199	176.2	22.68	0.12	0.11	-16.43	-15.34	75.61	2.71	10.0
	5	142.8	92.49	146.2	122.6	23.52	0.19	0.11	-16.4	-15.49	78.41	2.81	16.0
	10	111.2	81.89	123.4	99.47	20.41	0.20	0.10	-16.43	-15.47	68.06	2.43	42.0
	15	88.6	73.74	107.9	82.65	25.24	0.30	0.12	-16.43	-15.41	84.14	3.03	48.0
0.6	20	68.3	68.0	94.8	68.18	26.62	0.39	0.13	-16.43	-15.33	88.73	3.48	49.8
	25	57.0	62.3	84.2	59.12	25.08	0.42	0.12	-16.43	-15.03	83.6	2.48	46.5
	30	48.0	58.2	75.3	52.08	23.22	0.44	0.11	-16.43	-15.33	77.4	2.26	39.2
	35	0.45	55.0	67.0	49.0	18.00	0.36	0.09	-16.43	-15.4	60.0	2.58	26.2
	0	217	115	184.0	166	7.704	0.046	0.038	-17.32	-16.32	38.5	1.38	18.0
	5	142.8	92.49	132.9	117.6	2.98	0.025	0.014	-17.32	-16.04	14.94	0.53	31.0
	10	111.2	81.89	111.7	96.54	-0.61	-0.006	-0.03	-17.32	-16.54	-3.07	-0.11	40.0
	15	88.6	73.74	99.5	81.17	7.16	0.088	0.035	-17.32	-16.67	35.82	1.28	46.0

0.5	20	68.3	68.0	88.0	68.15	16.10	0.236	0.080	-17.32	-16.07	80.62	2.88	48.0
	25	57.0	62.3	80.7	59.65	21.05	0.35	0.105	-17.32	-16.07	105.2	3.77	45.0
	30	48.0	58.2	73.4	53.1	11.76	0.22	0.058	-17.17	-16.15	58.81	2.10	37.0
	35	45.0	55.0	66.0	50	-4.35	-0.08	-0.02	-17.17	-16.37	-21.72	-0.78	25.0
	0	217	115	175	155.8	19.2	0.12	0.096	-16.43	-15.43	144	5.16	20.0
	5	142.8	92.49	131.9	112.6	19.28	0.17	0.096	-16.434	-15.71	144.6	5.18	37.0
	10	111.2	81.89	111.6	93.61	17.98	0.19	0.08	-16.43	-15.5	134.8	4.83	50.0
0.4	15	88.6	73.74	99.2	79.68	19.51	0.24	0.09	-16.67	-15.85	146.3	5.24	56.0
	20	68.3	68.0	87.0	68.12	18.88	0.27	0.09	-16.67	-15.03	141.6	5.07	57.0
	25	57.0	62.3	78.9	60.18	18.72	0.31	0.09	-16.67	-15.83	140.4	5.03	54.0
	30	48.0	58.2	70.8	54.12	16.68	0.30	0.08	-16.67	-15.84	125.1	4.48	47.5
	35	45.0	55.0	65.1	51.0	14.1	0.27	0.07	-16.67	-15.9	105.7	3.79	34.0
	0	217.0	115.0	163.0	135.4	8.10	0.05	0.04	-12.78	-11.92	162.1	5.82	15.0
	5	142.8	92.49	108.9	102.5	6.34	0.06	0.03	-12.78	-11.20	126.9	4.52	26.0
	10	111.2	81.89	92.5	87.75	4.74	0.05	0.02	-12.78	-11.65	94.96	3.40	37.0
	15	88.6	73.74	81.9	76.71	5.18	0.06	0.02	-12.78	-11.28	103.7	3.71	43.0
0.2	20	68.3	68.0	73.0	68.06	4.94	0.07	0.02	-12.78	-11.48	98.8	3.54	45.0
	25	57.0	62.3	65.6	61.24	4.36	0.07	0.02	-12.78	-11.88	87.2	3.12	43.0
	30	48.0	58.2	59.9	56.16	3.74	0.06	0.02	-12.7	-11.7	74.8	2.68	34.0
	35	45.0	55.0	55.0	53.0	3.45	0.03	0.01	-12.78	-12.7	40.0	1.43	23.0

Table 29. Lift-off area of $(C_{12}Mal)_2Mn_2$, SPC and $\alpha_{(C_{12}Mn)_2Mal_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter (*I.P.*) and compression modulii (C_S^{-1}) of $(C_{12}Mal)_2Mn_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Mn)_2Mal_2}$	π/mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		Pure $Mn_2(C_{12}Mal)_2$	SPC	$Mn_2(C_{12}Mal)_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	182	115.0	176.0	168.6	2.28	0.01	11.42	-12.78	-12.78	2.85	0.10	10.0
	5	130.9	92.49	137.0	123.2	5.09	0.04	25.49	-12.78	-11.87	6.37	0.22	16.0
	10	115.0	81.89	115.9	108.3	7.522	0.06	0.037	-12.78	-12.17	9.40	0.33	23.0
0.8	15	106.0	73.74	98.0	99.54	-1.54	-0.01	-7.74	-12.78	-12.5	-1.93	-0.06	27.0
	20	102.7	68.0	86.0	95.76	-9.76	-0.10	-0.04	-12.39	-12.88	-12.2	-0.43	24.0
	25	99.3	62.3	76.0	91.9	-15.9	-0.17	-0.07	-12.39	-13.19	-19.8	-0.71	20.0
	30	100.0	58.2	68.0	91.64	-23.64	-0.25	-0.11	-12.39	-13.57	-29.55	-1.05	15.0
	35	182.0	115.0	176.0	168.6	2.28	0.01	0.011	-12.39	-12.02	2.84	0.12	12.0
	0	182.0	115.0	160.8	155.2	6.5	0.04	32.50	-16.43	-16.43	21.66	776.6	10.0
	5	130.9	92.49	122.5	115.5	10.30	0.08	0.051	-16.43	-16.61	34.35	0.01	16.0
	10	115.0	81.89	106.0	101.7	7.55	0.07	0.037	-16.52	-16.20	25.18	0.90	42.0
	15	106.0	73.74	94.0	93.09	5.13	0.05	0.025	-16.63	-16.90	17.10	0.61	48.0
0.6	20	102.7	68.0	84.0	88.82	1.65	0.01	0.008	-16.43	-16.50	5.50	0.19	49.8
	25	99.3	62.3	77.7	84.5	-0.8	-0.00	-0.004	-16.67	-17.40	-2.66	-0.09	46.5
	30	100.0	58.2	70.3	83.28	-5.4	-0.06	-0.020	-16.67	-17.32	-18.0	-0.64	39.2
	35	182.0	115	160.8	155.2	6.5	0.04	0.032	-16.67	-16.39	21.66	0.77	26.2
	0	182	115.0	155	148.5	5.60	0.03	0.02	-17.17	-16.84	28.02	1.00	18.0
	5	130.9	92.49	122	111.6	6.96	0.06	0.03	-17.17	-16.65	34.82	1.24	31.0
	10	115.0	81.89	106	98.44	4.24	0.04	0.02	-17.17	-16.79	21.22	0.76	40.0
	15	106.0	73.74	95.0	89.87	0.90	0.01	0.004	-17.17	-16.91	4.52	0.16	46.0

0.5	20	102.7	68.0	87.0	85.35	-4.82	-0.05	-0.02	-17.17	-17.09	-24.1	-0.86	48.0
	25	99.3	62.3	80.0	80.8	-6.80	-0.08	-0.03	-17.17	-17.21	-34.0	-1.12	45.0
	30	100.0	58.2	73.7	79.1	-12.98	-0.16	-0.06	-17.17	-17.44	-64.9	-2.32	37.0
	35	182.0	115.0	155	148.5	5.60	0.037	0.02	-17.17	-16.84	280	1.02	25.0
	0	182.0	115	141	141.8	-0.8	-0.04	-0.004	-16.43	-16.43	-6.02	-0.21	20.0
	5	130.9	92.49	110.7	107.8	2.84	0.02	0.014	-16.67	-16.20	21.34	0.76	37.0
	10	115.0	81.89	95.0	95.13	-0.13	-0.01	-0.67	-16.67	-16.10	-1.00	-0.03	50.0
	15	106.0	73.74	86.0	86.64	-0.64	-0.07	-0.003	-16.67	-16.70	-4.83	-0.17	56.0
0.4	20	102.7	68	77.3	81.88	-4.58	-0.05	-0.022	-16.67	-16.90	-34.35	-1.23	57.0
	25	99.3	62.3	70.0	77.10	-7.10	-0.09	-0.035	-16.43	-17.02	-53.25	-1.90	54.0
	30	100.0	58.2	65.0	74.92	-9.92	-0.10	-0.04	-16.20	-17.17	-74.4	-2.64	47.5
	35	182.0	115	141.0	141.8	-0.80	-0.005	-0.004	-16.16	-16.48	-6.00	-0.21	34.0
	0	182.0	115.0	136.0	128.4	7.60	0.05	0.038	-12.39	-12.01	152	5.48	15.0
	5	130.9	92.49	104.0	100.1	3.82	0.03	0019	-12.3	-12.20	76.56	2.74	26.0
	10	115.0	81.89	92.7	88.51	4.18	0.04	0.020	-12.3	-12.18	83.76	3.02	37.0
	15	106.0	73.74	85.3	80.19	5.10	0.06	0.025	-13.9	-12.14	102.1	3.66	43.0
0.2	20	102.7	68.0	78.0	74.94	3.06	0.04	0.015	-12.39	-12.24	61.2	2.19	45.0
	25	99.3	62.3	72.0	69.70	2.30	0.03	0.011	-12.78	-12.28	46.0	1.64	43.0
	30	100	58.2	68.0	66.56	1.44	0.02	0.007	-12.39	-12.32	28.8	1.03	34.0
	35	182	115.0	136.0	128.4	7.60	0.05	0.038	-12.39	-12.01	152	5.45	23.0

Table 30. Lift-off area of $(C_{12}Asp)_2Mn_2$, SPC and $\alpha_{(C_{12}Mn)_2Asp_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter (*I.P.*) and compression modulii (C_S^{-1}) of $(C_{12}Asp)_2Mn_2$+SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Mn)_2Asp_2}$	π/mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$Mn_2(C_{12}Asp)_2$	SPC	$Mn_2(C_{12}Asp)_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	206.0	115	194	187.8	6.20	0.03	0.031	-12.78	-11.99	7.75	0.27	10.0
	5	161.5	92.49	143	147.6	1.93	0.01	0.009	-12.39	-12.20	2.46	0.08	16.0
	10	121	81.89	121	113.1	7.822	0.06	0.039	-12.39	-12.00	9.77	0.35	23.0
0.8	15	97.6	73.74	106.4	92.82	13.57	0.14	0.067	-12.39	-11.71	16.96	0.60	27.0
	20	75.2	68.0	94.9	73.76	21.14	0.28	0.105	-12.39	-11.34	26.42	0.94	24.0
	25	61.3	62.3	83.6	61.5	22.10	0.35	0.110	-12.39	-11.29	27.62	0.99	20.0
	30	49.6	58.2	74.6	51.32	23.28	0.45	0.116	-12.39	-11.23	29.1	1.04	15.0
	35	32.87	55.0	67.3	37.29	30.02	0.80	0.150	-12.39	-10.89	37.54	1.34	12.0
	0	206.0	115.0	175	169.6	5.40	0.031	0.02	-16.43	-16.40	18.0	0.64	10.0
	5	161.5	92.49	129.3	133.8	-4.59	-0.03	-0.02	-16.43	-16.90	-15.32	-0.5	16.0
	10	121.0	81.89	106.5	105.3	1.14	0.01	0.005	-16.67	-16.60	3.81	0.13	42.0
	15	97.6	73.74	93.5	88.05	5.44	0.06	0.02	-16.67	-16.40	18.14	0.65	48.0
0.6	20	75.2	68.0	82.0	72.32	9.68	0.13	0.04	-16.67	-16.19	32.26	1.15	49.8
	25	61.3	62.3	72.3	61.70	10.6	0.17	0.05	-16.67	-16.14	35.33	1.26	46.5
	30	49.6	58.2	64.9	53.04	11.86	0.22	0.05	-16.67	-16.08	39.53	1.41	39.2
	35	32.87	55.0	58.4	41.72	16.67	0.39	0.08	-16.67	-15.84	55.59	1.99	26.2
	0	206	194	170	200	-30.0	-0.15	-0.15	-17.17	-17.31	-150	-5.37	18.0
	5	161.5	143	126.6	152.2	-25.65	-0.16	-0.12	-17.17	-17.74	-28.25	-4.56	31.0
	10	121	121	107.9	121	-13.1	-0.10	-0.06	-17.17	-17.47	-65.5	-2.34	40.0
	15	97.6	106.4	96.5	102	-5.50	-0.05	-0.02	-17.17	-17.44	-27.5	-0.98	46.0

0.5	20	75.2	94.9	87.5	85.05	2.45	0.02	0.01	-17.17	-17.05	12.25	0.43	48.0
	25	61.3	83.6	79.3	72.45	6.85	0.094	0.03	-17.17	-16.83	34.25	1.27	45.0
	30	49.6	74.6	75.3	62.1	13.2	0.21	0.06	-17.17	-16.51	66.0	2.36	37.0
	35	32.87	67.3	68.8	50.08	18.71	0.37	0.09	17.17	-16.23	93.5	3.35	25.0
	0	206.0	115.0	169.0	151.4	17.6	0.11	0.08	-16.67	-15.79	132.0	4.7	20.0
	5	161.5	92.49	131.5	120.0	11.40	0.09	0.05	-16.48	-16.10	85.54	3.06	37.0
	10	121.0	81.89	112	97.53	14.46	0.14	0.07	-16.67	-15.95	108.4	3.88	50.0
	15	97.6	73.74	98.8	83.28	15.51	0.18	0.07	-16.67	-15.89	116.3	4.17	56.0
	20	75.2	68	87.5	70.88	16.62	0.23	0.08	-16.67	-15.84	124.6	4.47	57.0
	25	61.3	62.3	78.5	61.9	16.6	0.26	0.08	-16.67	-15.84	124.5	4.46	54.0
0.4	30	49.6	58.2	71.2	54.76	16.44	0.30	0.08	-16.67	-15.85	123.3	4.41	47.5
	35	32.87	55	64.7	46.14	18.55	0.40	0.09	-16.67	-15.74	139.1	4.98	34.0
	0	206.0	115	159	133.2	15.33	0.11	0.070	-7.97	-7.89	306.6	1.48	15.0
	5	161.5	92.49	124.3	106.2	8.04	0.07	0.040	-7.97	-8.41	160.9	5.94	26.0
	10	121.0	81.89	86.8	89.7	-2.90	-0.03	-0.01	-7.97	-8.12	-58.24	-2.50	37.0
	15	97.6	73.74	73.8	78.51	-4.712	-0.06	-0.023	-7.97	-8.21	-94.24	-3.52	43.0
0.2	20	75.2	68.0	65.6	69.44	-3.84	-0.05	-0.019	-7.97	-8.16	-76.80	-2.51	45.0
	25	61.3	62.3	59.9	62.1	-2.20	-0.03	-0.011	-7.97	-8.08	-44.00	-1.80	43.0
	30	49.6	58.2	55.9	56.48	-0.58	-0.01	-0.002	-7.97	-8.00	-11.60	-0.40	34.0
	35	32.87	55.0	50.9	50.57	0.32	0.006	0.001	-7.97	-7.96	6.52	0.23	23.0

Table 31. Lift-off area of $Mn_2(C_{12}Glu)_2$, SPC and $\alpha_{(C_{12}Mn)_2Glu_2}$, ideal value of molecular area (A_{id}), excess area per molecule (A_{ex}), ratio of A_{ex}/A_{id}, Gibbs free energy (ΔG_{ex}), ideal Gibbs free energy (ΔG_{ideal}), free energy of mixture (ΔG_{mix}), interaction parameter (*I.P.*) and compression modulii (C_S^{-1}) of $(C_{12}Glu)_2Mn_2$+ SPC mixed monolayer system at different surface pressure. Temperature: 298K.

$\alpha_{(C_{12}Mn)_2Glu_2}$	Pressure / mN m^{-1}	A_0/ nm^{2}molecule^{-1}			A_{id}	A_{ex}	A_{ex}/A_{id}	ΔG_{ex}	ΔG_{ideal}	ΔG_{mix}	w	$I.P.\times10^{-3}$	C_S^{-1}/ mNm^{-1}
		$(C_{12}Glu)_2Mn_2$	SPC	$(C_{12}Glu)_2Mn_2$: SPC	nm^2 molecule^{-1}			kJ mol^{-1}					
	0	206	115	183	187.8	-4.8	-0.025	-0.024	-12.39	-12.63	-6.00	-0.21	10.0
	5	138	92.49	133	128.8	4.10	0.031	0.020	-12.39	-12.19	5.12	0.18	16.0
	10	97.7	81.89	101	94.53	6.46	0.068	0.032	-12.39	-12.07	8.07	0.28	23.0
0.8	15	78.5	73.74	85	77.54	7.45	0.096	0.037	-12.39	-12.02	9.31	0.33	27.0
	20	74.3	68	73.6	73.04	0.56	0.007	0.002	-12.39	-12.36	0.70	0.025	24.0
	25	72	62.3	64.7	70.06	-5.36	-0.07	-0.02	-12.39	-12.66	-6.7	-0.24	20.0
	30	64.7	58.2	57	63.4	-6.4	-0.10	-0.03	-12.39	-12.71	-8.0	-0.28	15.0
	35	206	115	183	187.8	-4.8	-0.02	-0.02	-12.39	-12.63	-6.0	-215.0	12.0
	0	206	115	174	169.6	4.4	0.025	0.02	-16.67	-16.45	14.66	0.52	10.0
	5	138	92.49	133	119.7	13.23	0.11	0.06	-16.67	-16.01	44.01	1.57	16.0
	10	97.7	81.89	111.3	91.37	19.91	0.21	0.09	-16.67	-15.67	66.41	2.38	42.0
	15	78.5	73.74	97.4	76.59	20.82	0.27	0.10	-16.67	-15.63	69.34	2.48	48.0
0.6	20	74.3	68	85	71.78	13.22	0.18	0.06	-16.67	-16.01	44.06	1.57	49.8
	25	72	62.3	77	68.12	8.88	0.13	0.04	-16.67	-16.23	29.6	1.06	46.5
	30	64.7	58.2	69.7	62.1	7.6	0.12	0.03	-16.67	-16.29	25.33	0.90	39.2
	35	206	115	174	169.6	4.4	0.02	0.02	-16.67	-16.45	14.66	0.52	26.2
	0	206	115	161.8	160.5	-8.32	-0.05	-0.04	-17.17	-17.10	-41.63	-1.49	18.0
	5	138	92.49	128	115.2	8.34	0.07	0.04	-17.17	-16.53	41.72	1.49	31.0
	10	97.7	81.89	107	89.79	12.58	0.14	0.062	-17.17	-16.31	62.94	2.25	40.0
	15	78.5	73.74	91.3	76.12	15.18	0.19	0.075	-17.17	-16.41	75.9	2.72	46.0

0.5	20	74.3	68.0	79.9	71.15	4.33	0.06	0.021	-17.17	-16.73	21.65	0.77	48.0
	25	72.0	62.3	72.0	67.15	0.84	0.012	0.004	-17.17	-16.93	4.21	0.15	45.0
	30	64.7	58.2	64.0	61.45	-5.67	-0.09	-0.02	-17.17	-17.04	-28.35	-1.01	37.0
	35	206	115	161.8	160.5	-8.32	-0.05	-.041	-17.17	-17.10	-41.63	-1.49	25.0
	0	206	115	151.8	151.4	0.40	0.01	0.002	-16.64	-16.62	3.0	0.10	20.0
	5	138	92.49	116	110.6	5.30	0.04	0.026	-16.64	-16.40	39.79	1.42	37.0
	10	97.7	81.89	98	88.21	9.78	0.11	0.048	-16.64	-16.18	73.35	2.63	50.0
	15	78.5	73.74	86.8	75.64	11.15	0.14	0.05	-16.64	-16.11	83.67	2.95	56.0
0.4	20	74.3	68.0	78.7	70.52	8.18	0.11	0.04	-16.64	-16.26	61.35	2.19	57.0
	25	72.0	62.3	71.4	66.18	5.22	0.07	0.02	-16.64	-16.41	39.15	1.40	54.0
	30	64.7	58.2	64.8	60.80	4.0	0.06	0.02	-16.64	-16.47	30.00	1.07	47.5
	35	206	115	151.8	151.4	0.4	0.01	0.02	-16.64	-16.65	3.00	0.10	34.0
	0	206.0	115.0	104.0	133.2	-8.72	-0.06	-0.04	-12.39	-13.85	-17.55	-6.25	15.0
	5	138.0	92.49	93.0	101.5	-4.97	-0.04	-0.02	-12.39	-12.82	-99.53	-3.56	26.0
	10	97.7	81.89	83.6	85.05	-1.40	-0.01	-0.007	-12.39	-12.47	-29.04	-1.04	37.0
	15	78.5	73.74	77.4	74.69	2.70	0.03	0.013	-12.39	-12.26	54.16	1.94	43.0
0.2	20	74.3	68.0	73.0	69.26	3.74	0.05	0.018	-12.39	-12.21	74.8	2.68	45.0
	25	72.0	62.3	67.8	64.24	3.56	0.05	0.017	-12.39	-12.21	71.2	2.52	43.0
	30	64.7	58.2	64.3	59.5	4.80	0.08	0.024	-12.39	-12.15	96.0	3.42	34.0
	35	206.0	115.0	104.0	133.2	-8.72	-0.06	-0.04	-12.39	-13.85	-174.5	-6.25	23.0

Table 32. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Mal)_2Ca_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 3:2 (M/M) $(C_{12}Mal)_2Ca_2$ and SPC mixed monolayer system was used. Temperature: 298K.

Surface concentration/ mm^2partile^{-1}	Surface elasticity/ mNm^{-1}					π/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
80.70409	0.3	0.1	0.3	0.88936	0.3	0.48
75.71239	0.3	0.1	0.3	0.75864	0.3	0.54
70.72069	0.3	0.2	0.2	0.63861	0.3	0.58
65.74892	0.1	0.1	0.0	0.79227	0.1	0.63
60.76719	0.2	0.2	0.0	1.40372	0.2	0.70
55.79044	4.7	4.6	1.0	4.57928	4.7	0.86
53.30953	11.1	10.2	4.5	13.01286	11.1	1.19
50.80372	24.1	19.9	13.5	21.74399	24.1	2.08
48.31783	27.1	23.4	13.6	26.21146	27.1	3.32
45.82697	31.4	27.2	15.8	28.90078	31.4	4.78
43.34606	37	30.8	20.5	34.28847	37.0	6.46
40.86516	42.3	35.9	22.4	41.15367	42.3	8.70
38.35437	50.7	42.8	27.3	52.83429	50.7	11.49
35.87845	60.6	50.8	33.0	62.57667	60.6	15.56
33.39256	72.2	58.6	42.1	71.63906	72.2	20.14
30.88675	87.4	73.2	47.8	73.30105	87.4	26.28
28.41083	90.8	75.8	49.9	65.29177	90.8	31.97

Table 33. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Asp)_2Mn_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 1:4 (M/M) $(C_{12}Asp)_2Mn_2$ and SPC mixed surfactant system was used. Temperature: 298K.

Surface concentration/ mm^2particle^{-1}	Surface elasticity/ mNm^{-1}					π/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
403.52043	0.3	0	0.3	0.40379	0.3	0.255
378.53703	0.3	0.1	0.3	0.26553	0.3	0.28
353.67818	0.3	0.1	0.3	0.10674	0.3	0.29
328.84424	0.3	0.1	0.3	2.63517	0.3	0.295
303.81103	0.3	0.0	0.3	0.1655	0.3	0.29
279.0269	0.3	0.0	0.3	0.1664	0.3	0.265
254.04351	2.1	1.7	1.3	5.82034	2.1	0.32
241.6639	22.3	18.7	12.2	17.30118	22.3	0.86
229.20956	27.3	23.3	14.2	27.06666	27.3	2.10
216.6556	32.3	26.8	18.1	33.04348	32.3	3.815
204.27599	39.0	33.1	20.5	39.58726	39.0	5.90
191.79675	46.6	39.3	25.1	39.18947	46.6	8.635

Table 34. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity and surface pressure at different surface concentration of $(C_{12}Mal)_2Ca_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 2:3 (M/M) $(C_{12}Mal)_2Ca_2$ and SPC mixed monolayer system was used. Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	**Surface elasticity/ mNm^{-1}**					**Surface Pressure/ mNm^{-1}**
	Dynamic |ε|	**Imaginary, Im(ε)**	**Real, Re(ε)**	**Static**	**Dynamic, |ε|**	
403.52043	0.20	0.20	0.10	0.64606	0.20	0.475
378.53703	2.50	2.30	0.80	5.78491	2.50	0.515
353.67818	21.3	17.8	11.8	16.62307	21.3	1.235
341.22385	24.7	20.7	13.5	24.03262	24.7	2.045
328.69479	27.8	23.3	15.2	27.22712	27.8	2.995
316.34009	30.9	25.6	17.3	31.03819	30.9	4.105
303.88575	36.0	30.4	19.3	32.208	36.0	5.430
291.43142	39.8	35.1	18.9	32.24387	39.8	6.745
286.37496	40.8	33.9	22.6	34.35207	40.8	7.330
281.34341	43.9	38.0	22.0	38.82743	43.9	7.955
276.33677	45.8	39.6	23.1	43.82277	45.8	8.715
271.52939	47.2	39.4	25.9	42.41872	47.2	9.510
266.49784	49.2	41.2	26.8	41.10271	49.2	10.25
261.54102	51.8	45.3	25.1	46.04956	51.8	11.05
256.53437	53.8	47.0	26.2	43.33103	53.8	12.005
251.50282	54.6	45.5	30.2	28.02484	54.6	12.745
246.62072	56.1	47.9	29.2	18.69066	56.10	13.115

Table 35. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Asp)_2Mn_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 3:2 (M/M) $(C_{12}Asp)_2Mn_2$ and SPC mixed monolayer system was used. Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	Surface elasticity/ mNm^{-1}					Surface Pressure/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
807.04085	0.2	0.0	0.2	0.64606	0.2	0
757.07406	0.2	0.1	0.2	1.59607	0.2	0.04
707.30654	12.1	10.0	6.7	9.76361	12.1	0.21
682.29824	23.8	20.3	12.4	19.49347	23.8	0.815
672.43441	24.7	20.8	13.4	22.26885	24.7	1.14
662.67021	25.7	21.4	14.2	23.10613	25.7	1.465
652.65692	27.2	23.1	14.3	23.71804	27.2	1.83
642.44437	28.0	23.5	15.2	24.63255	28.0	2.2
632.68017	27.0	22.8	14.5	24.7228	27.0	2.595
622.46762	30.7	27.0	14.6	24.84315	30.7	2.98
612.85287	31.5	26.4	17.1	27.9136	31.5	3.385
602.54068	32.7	27.7	17.4	26.34722	32.7	3.89
592.92594	34.4	29.2	18.2	24.53586	34.4	4.26
582.7632	35.8	30.0	19.6	25.81751	35.8	4.71
572.94919	35.5	29.7	19.5	25.63643	35.5	5.145
562.98572	36.8	30.9	20.0	23.76287	36.8	5.595
552.92262	37.6	31.1	21.0	19.11994	37.6	5.99
543.05878	39.9	33.6	21.5	21.27707	39.9	6.285
532.94587	40.3	33.7	22.1	22.31185	40.3	6.775
522.88276	40.9	34.6	21.8	20.71113	40.9	7.13
512.86948	41.6	35.2	22.2	18.65944	41.6	7.57
503.1551	42.9	36.3	22.9	15.79357	42.9	7.85
493.14181	44.6	38.4	22.8	16.74458	44.6	8.19
543.05878	39.9	33.6	21.5	0.64606	0.2	6.285
532.94587	40.3	33.7	22.1	1.59607	0.2	6.775
522.88276	40.9	34.6	21.8	9.76361	12.1	7.13
512.86948	41.6	35.2	22.2	19.49347	23.8	7.57
503.1551	42.9	36.3	22.9	22.26885	24.7	7.85
493.14181	44.6	38.4	22.8	23.10613	25.7	8.19

Table 36. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Mal)_2Cd_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 3:2 (M/M) $(C_{12}Mal)_2Cd_2$ and SPC mixed monolayer system was used Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	Surface elasticity/ mNm^{-1}					Surface Pressure/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
807.04085	0.2	0.0	0.2	0.000	0.2	0.1
757.1737	0.2	0.0	0.2	0.38017	0.2	0.1
707.38127	0.2	1.0	0.2	0.71051	0.2	0.15
657.61375	0.2	0.0	0.2	0.33034	0.2	0.2
607.87114	0.2	0.1	0.2	0.0000	0.2	0.2
558.02889	0.2	0.1	0.2	1.39879	0.2	0.2
508.16174	17.8	14.7	10	12.69226	17.8	0.45
498.14846	21.2	17.5	12	22.52792	21.2	0.9
488.25971	22.6	18.5	12.9	23.33014	22.6	1.35
478.27134	24.4	20.2	13.6	23.76492	24.4	1.85
468.13351	26.4	21.8	14.8	23.37924	26.4	2.35
458.24477	28.0	23.0	15.9	24.45823	28	2.85
448.45566	29.2	24.2	16.3	30.29257	29.2	3.4
438.31783	31.4	25.2	18.7	32.69172	31.4	4.2
428.35437	34.4	28.8	19	33.36498	34.4	4.9
418.41581	36.6	30.4	20.3	34.73271	36.6	5.75
408.47725	38.3	32.2	20.8	36.88773	38.3	6.55
398.48887	40.5	33.8	22.2	34.08728	40.5	7.55
388.62504	42.4	35	23.9	37.13428	42.4	8.25
378.63667	46.2	38.1	26.2	50.89464	46.2	9.45
368.54865	49.3	40	28.9	52.49372	49.3	10.95
358.635	53.5	43.9	30.5	51.75669	53.5	12.3
348.79608	57.6	46.9	33.3	56.99151	57.6	13.8
338.75789	62.5	51.1	36	56.26072	62.5	15.55
328.62006	68.6	56.0	39.6	55.45616	68.6	17.15
318.88077	71.9	58.0	42.4	59.3927	71.9	18.9
308.76785	73.3	59.6	42.7	62.14633	73.3	20.85
298.75457	81.4	65.9	47.7	53.39779	81.4	22.95
288.94055	82.9	67.2	48.6	53.00771	82.9	24.4
278.90236	90.8	73.2	53.7	61.58696	90.8	26.6
269.01362	96.1	75.9	59	58.27443	96.1	28.8
259.05015	96.2	75.8	59.2	54.6	0.2	30.9

Table 37. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Glu)_2Cd_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 2.5:2.5 (M/M) $(C_{12}Glu)_2Cd_2$ and SPC mixed surfactant system was used. Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	Surface elasticity/ mNm^{-1}					Surface Pressure/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
498.09649	0.2	0	0.1	0	0.2	0
467.45267	0.2	0	0.2	0	0.2	0
436.62435	0.2	0.1	0.2	0	0.2	0
421.23326	0.1	0	0.1	0	0.1	0
405.88829	0.1	0	0.1	0	0.1	0
390.51257	0.1	0	0.1	0	0.1	0
375.04459	0.1	0	0.1	0	0.1	0
359.838	0.1	0	0.1	1.16549	0.1	0
344.40078	0.1	0	0.1	1.11549	0.1	0.1
329.04043	0.1	0	0.1	0.0000	0.1	0.1
313.64934	0.1	0.1	0.0	0.0000	0.1	0.1
298.28899	0.4	0.2	0.3	1.21554	0.4	0.1
292.15408	1.5	1.3	0.8	2.38108	1.5	0.15
286.01916	10.5	8.7	5.9	9.32431	10.5	0.2
279.88425	20.4	16.8	11.5	19.248	20.4	0.55
273.67246	22.4	18.5	12.7	24.33019	22.4	1.05
267.5068	25.1	20.8	14.2	26.26317	25.1	1.65
261.44876	26.4	22	14.5	27.56981	26.4	2.25
255.19084	28.5	23.4	16.3	28.97881	28.5	2.95
249.11743	30.3	24.8	17.3	30.68064	30.3	3.65
243.01327	33.7	27.6	19.5	32.38797	33.7	4.45
236.73998	34.8	28.9	19.3	34.27688	34.8	5.3
230.57431	37.8	30.9	21.7	34.71862	37.8	6.25
224.45478	41.0	33.3	23.9	36.67839	41.0	7.15
218.33524	44.4	35.9	26	40.03562	44.4	8.25
212.18495	47.7	38.7	27.9	41.02915	47.7	9.4
205.92703	49.8	41.1	28.1	44.12217	49.8	10.65
199.8075	52.8	42.7	31	46.58695	52.8	12.05
193.70333	58.0	46.6	34.6	49.77717	58.0	13.5
187.55305	61.4	50.2	35.5	44.8205	61.4	15.2
178.37374	67.9	55.3	39.4	76.8204	67.9	17.05
175.19097	70.6	57.4	41.1	89.60631	70.6	19.15
169.13293	78.9	62.5	48.1	63.54648	78.9	21.35
162.95189	86.4	68.7	52.4	73.22291	86.4	23.75
156.87848	91.9	73.8	54.7	77.19616	91.9	26.85
150.65132	98.0	78.0	59.5	67.93066	98.0	29.8
144.57791	96.7	77.5	57.8	61.89316	96.7	32.4

Table 38. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Mal)_2Cd_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 1:4 (M/M) $(C_{12}Mal)_2Cd_2$ and SPC mixed monolayer system was used Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	Surface elasticity/ mNm^{-1}					Surface Pressure/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
403.48306	0.1	0.1	0.2	0	0.1	0
378.63667	0.1	0.0	0.1	0	0.1	0
353.728	0.2	0.2	0.1	0	0.2	0
328.78197	1.7	1.6	0.4	0.66031	1.7	0
303.88575	4.6	4.6	0.0	9.78324	4.6	0.1
298.91647	19.4	16.8	9.9	17.95631	19.4	0.4
293.89738	22.7	19.1	12.3	21.89337	22.7	0.7
288.85337	23.4	19.5	12.3	24.74843	23.4	1.15
283.98373	25.6	21.4	14	18.0605	25.6	1.55
273.99535	26.7	22.4	14.5	36.34663	26.7	2.0
269.00116	30.7	25.7	16.8	43.56377	30.7	3.1
264.03188	32.3	27.1	17.7	49.9867	32.3	3.615
261.54102	33.5	28.0	18.4	70.25898	33.5	4.3
259.0626	35.6	29.7	19.6	53.3754	35.6	4.95
254.05596	38.3	32.2	20.7	40.75718	38.3	5.7
249.08668	39.9	33.2	22.2	42.50027	39.9	6.55
244.09249	41.9	35.0	23	42.7659	41.9	7.4
239.09831	45.2	39.0	23	49.34956	45.2	8.3
234.15394	47.6	40.0	25.8	42.62191	47.6	9.45
229.20956	49.4	42.5	25.2	39.2215	49.4	10.1
224.22783	52.5	45.2	26.7	47.78196	52.5	11.15
219.12155	55.1	45.7	30.6	52.04972	55.1	12.25
214.11491	59.5	50.2	32	59.51353	59.5	13.55
209.22036	62.9	53.2	33.4	63.53858	62.9	15
204.23863	67.3	56.0	37.3	69.69575	67.3	16.55
199.25689	72.9	62.3	37.9	75.70495	72.9	18.4
194.23779	77.5	64.5	43.1	79.75156	77.5	20.35
189.26852	83.8	70.9	44.6	83.05185	83.8	22.5
184.32414	88.3	73.3	49.3	93.34006	88.3	24.7
179.30505	92.4	76.4	52	88.69963	92.4	27.55
174.32331	97.3	81.2	53.6	53.65962	97.3	29.65

Table 39. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Glu)_2Ca_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 4:1 (M/M) $(C_{12}Glu)_2Ca_2$ and SPC mixed monolayer system was used. Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	Surface elasticity/ mNm^{-1}					Surface Pressure/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
269.17967	0.3	0	0.3	0	0.3	0.3
252.40784	0.4	0.1	0.4	0	0.4	0.3
235.77715	0.2	0.1	0.2	0	0.2	0.3
227.50747	0.6	0.5	0.4	2.72918	0.6	0.3
219.17137	15.2	12.7	8.4	12.65336	15.2	0.5
215.89173	20.5	17.2	11.1	21.22168	20.5	0.8
212.56227	22.8	19.2	12.2	22.09976	22.8	1.15
209.15809	23.5	19.6	13.1	21.80094	23.5	1.5
205.84523	24.3	20.2	13.5	23.3949	24.3	1.85
202.55729	26.1	21.9	14.1	16.61628	26.1	2.25
194.30422	27.0	22.7	14.6	16.61628	27.0	2.6
195.93989	28.2	23.6	15.3	16.61628	28.2	3.0
192.60213	29.5	24.9	15.8	28.16487	29.5	3.5
185.94321	33.6	28.6	17.7	28.77678	33.6	4.45
182.64696	33.2	27.89	17.9	28.88431	33.2	5.0
179.3009	36.3	30.5	19.6	29.51207	36.3	5.5
175.96314	37.7	31.8	20.3	32.20201	37.7	6.1
172.74161	39.7	33.8	20.8	33.80349	39.7	6.7
169.32913	40.7	34.1	22.1	34.27544	40.7	7.4
166.07439	42.3	35.3	23.2	36.24128	42.3	8.05
162.69512	44.8	37.8	24	38.85299	44.8	8.85
159.37396	46.9	39.3	25.7	37.51084	46.9	9.65
156.11093	49.1	41.4	26.4	38.98785	49.1	10.4
152.77317	51.3	43.3	27.5	42.33831	51.3	11.3
149.4354	53.9	45.4	29	44.94787	53.9	12.25
146.12255	55.9	46.7	30.6	46.99759	55.9	13.3
142.75158	61.3	51.2	33.6	49.34101	61.3	14.4
139.46363	63.8	52.7	36.0	52.88229	63.8	15.6
136.15908	65	54.2	35.9	58.87629	65.0	16.9
132.87114	71.3	59.8	38.7	64.40791	71.3	18.45
129.55829	77.5	64.6	42.8	64.04984	77.5	20.1

Table 40. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Asp)_2Mn_2$+SPC mixed monolayer in the presence of 30 mole % cholesterol at air-water interface. 3:2 (M/M) $(C_{12}Asp)_2Mn_2$ and SPC mixed monolayer system was used. Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	Surface elasticity/ mNm^{-1}					Surface Pressure/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
403.52043	0.3	0.1	0.3	0	0.3	0.2
353.69063	0.3	0.1	0.3	0	0.3	0.2
328.81933	0.2	0.1	0.2	0	0.2	0.2
303.82348	0.2	0	0.2	0	0.2	0.2
298.89156	0.2	0.1	0.2	0	0.2	0.2
293.87247	0.2	0	0.2	0	0.2	0.2
288.9281	0.2	0	0.2	0	0.2	0.2
283.95882	0.2	0	0.2	0	0.2	0.2
278.93972	0.2	0	0.2	0	0.2	0.2
269.00116	0.2	0	0.2	0	0.2	0.2
264.04434	0.2	0.1	0.2	0	0.2	0.2
259.0377	0.1	0.0	0.1	0	0.1	0.2
254.05596	0.2	0.0	0.2	0.0	0.2	0.2
249.09914	0.2	0.0	0.2	0.0	0.2	0.2
244.05513	0.2	0.1	0.1	0.0	0.2	0.2
239.12321	0.1	0.1	0.1	0.0	0.1	0.2
234.10412	0.2	0.1	0.2	0.0	0.2	0.2
229.10993	0.7	0.4	0.6	2.34643	0.7	0.2
224.22783	4.0	3.7	1.8	5.59790	4.0	0.3
219.13401	18.3	15.4	9.9	13.24894	18.3	0.45
214.21455	21.9	17.9	12.6	22.79495	21.9	0.9
209.27018	24.9	20.7	13.8	25.29973	24.9	1.5
204.28844	25.1	21.0	13.8	26.54803	25.1	2.1
199.26935	28.0	23.0	16.0	28.89578	28.0	2.8
194.28761	29.8	24.5	17.0	30.07054	29.8	3.55
189.25606	32.6	26.9	18.4	31.23176	32.6	4.35
184.28678	33.3	27.4	19.0	32.40784	33.3	5.2
179.30505	37.3	31.0	20.8	36.14209	37.3	6.1
174.36068	39.1	32.3	22.1	37.77047	39.1	7.2
169.37894	42.0	34.2	24.4	38.19913	42.0	8.25
164.38476	44.6	36.6	25.4	40.42425	44.6	9.45

Table 41. Dynamic, imaginary (Im(ε), real Re (ε), static surface elasticity at different surface pressure and different surface concentration of $(C_{12}Asp)_2Mn_2$+SPC mixture in the presence of 30 mole % cholesterol at air-water interface. 3:2 (M/M) $(C_{12}Asp)_2Mn_2$ and SPC mixed surfactant system was used. Temperature: 298K.

Surface concentration/ $mm^2particle^{-1}$	Surface elasticity/ mNm^{-1}					Surface Pressure/ mNm^{-1}
	Dynamic |ε|	Imaginary, Im(ε)	Real, Re(ε)	Static	Dynamic, |ε|	
538.02723	0.2	0.0	0.2	0.0	0.2	0.2
471.57091	0.3	0.0	0.3	0.0	0.3	0.2
405.24743	19.7	16.4	11.0	21.24726	19.7	0.2
398.5719	22.2	18.5	12.2	32.89826	22.2	0.9
391.92959	24.0	20.2	12.9	23.602	24.0	1.3
385.28728	25.0	21.0	13.7	24.55497	25.0	1.7
378.59515	26.6	22.2	14.6	25.4896	26.6	2.15
371.91963	27.6	23.1	15.0	23.70621	27.6	2.6
365.26071	29.2	24.5	16.0	26.28424	29.2	3.0
358.70143	31.1	26.3	16.7	31.15882	31.1	3.55
352.02591	32.3	26.9	17.8	29.03648	32.3	4.15
345.36699	34.2	28.4	19.0	31.02911	34.2	4.65
338.67486	36.2	30.0	20.2	34.70861	36.2	5.35
332.19861	37.1	31.4	19.9	34.0019	37.1	6.0
325.48987	38.6	32.2	21.4	35.31118	38.6	6.7
318.83095	41.2	34.3	22.8	37.01218	41.2	7.45
312.13882	43.8	36.6	24.2	37.50118	43.8	8.25
305.51312	47.2	39.1	26.3	37.01218	47.2	9.05
305.51312	47.8	40.4	25.7	37.50118	47.8	10.0
292.2451	51.3	43.5	27.1	31.25047	51.3	10.85
285.56958	54.1	45.2	29.7	49.47486	54.1	11.85
278.96048	56.6	47.2	31.2	51.46397	56.6	13.15
272.28496	61.2	50.7	34.3	50.9857	61.2	14.3
265.60943	64.5	53.6	35.9	57.15084	64.5	15.65
259.03354	68.2	56.5	38.1	60.97731	68.2	17.15
252.44105	73.8	60.9	41.8	65.44031	73.8	18.75
245.73231	79.7	65.5	45.4	72.82366	79.7	20.6
239.10661	86.0	70.8	48.9	79.28923	86.0	22.7
232.4643	90.0	74.3	50.8	78.74438	90.0	25.0
225.82199	96.7	79.7	54.7	75.54906	96.7	27.2
219.16307	100.3	82.2	57.4	74.05362	100.3	29.45