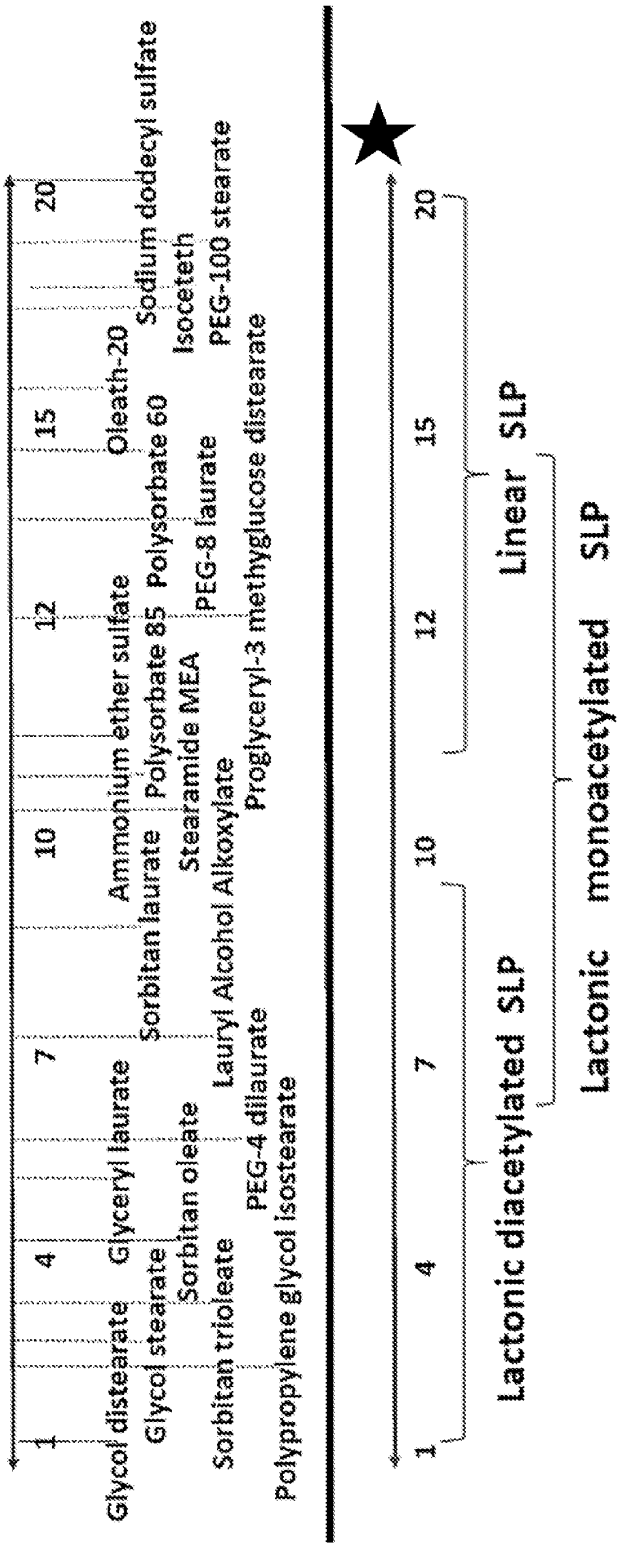

1
4
7
10
12
15
20
Glycol distearate
Glycol stearate
Sorbitan trioleate
Polypropylene glycol isostearate
Glyceryl laurate
Sorbitan oleate
PEG-4 dilaurate
Sorbitan laurate
Lauryl Alcohol Alkoxylate
Ammonium ether sulfate
Polysorbate 85
Stearamide MEA
Progliceryl-3 methyglucose distearate
PEG-8 laurate
Polysorbate 60
Oleath-20
Isoceteth
PEG-100 stearate
Sodium dodecyl sulfate
Lactonic diacetylated SLP
Lactonic monoacetylated SLP
Linear SLP

FIG. 1

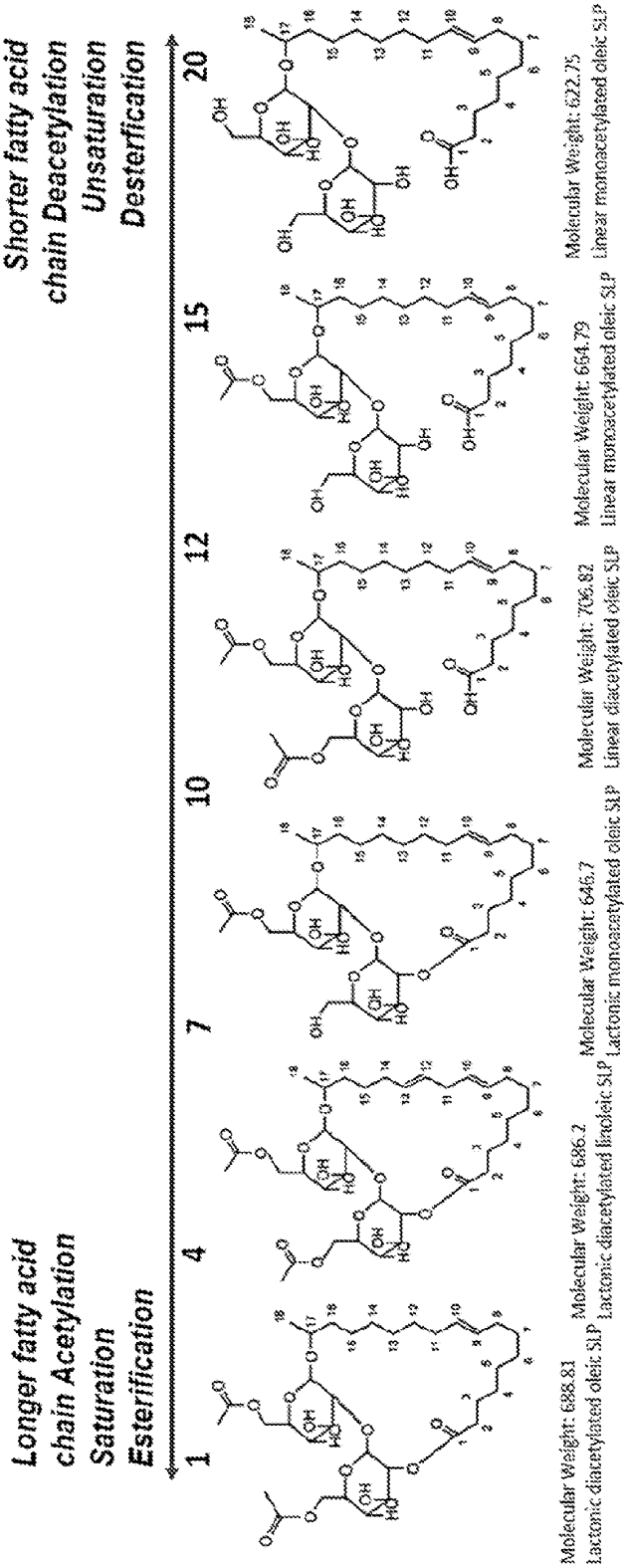

Longer fatty acid chain Acetylation Saturation Esterification
Shorter fatty acid chain Deacetylation Unsaturation Desterification
1
4
7
10
12
15
20
Molecular Weight: 688.81
Lactonic diacetylated oleic SLP
Molecular Weight: 686.2
Lactonic diacetylated linoleic SLP
Molecular Weight: 646.7
Lactonic monoacetylated oleic SLP
Molecular Weight: 706.82
Linear diacetylated oleic SLP
Molecular Weight: 664.79
Linear monoacetylated oleic SLP
Molecular Weight: 622.75
Linear monoacetylated oleic SLP

FIG. 2

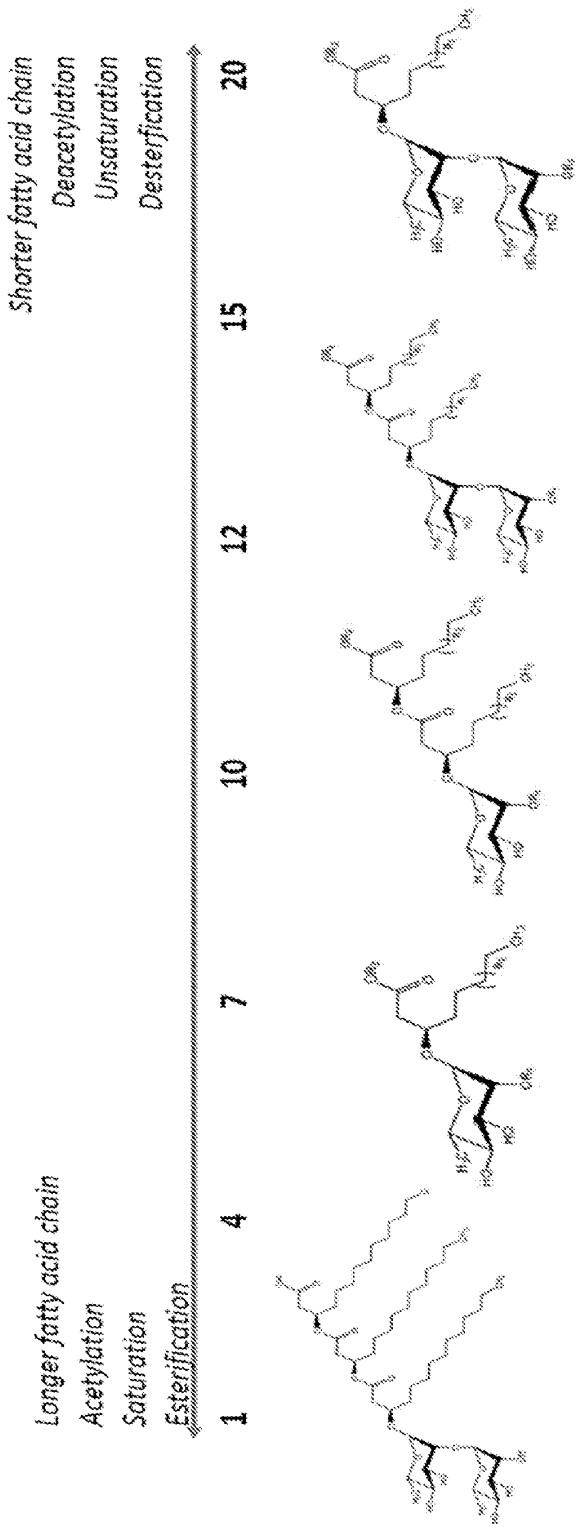

Longer fatty acid chain
Acetylation
Saturation
Esterification
Shorter fatty acid chain
Deacetylation
Unsaturation
Desterfication
1
4
7
10
12
15
20

FIG. 3

No.	Symbol	M. Form.	MW	R_1	n_1	n_2	R_2	Structure
Mono-rhamno-mono-lipidic congeners								
1	Rha-$C_{8:0}$	$C_{14}H_{26}O_7$	306.35	H	1	-	H	
2	Rha-$C_{9:0}$	$C_{15}H_{28}O_7$	320.38	H	1	-	H	
3	Rha-$C_{10:0}$	$C_{16}H_{30}O_7$	334.41	H	1	-	H	
4	Rha-$C_{10:1}$	$C_{16}H_{28}O_7$	332.43	H	5(-4H)	-	H	
5	Rha-$C_{12:0}$	$C_{18}H_{34}O_7$	362.46	H	5	-	H	
6	Rha-$C_{12:1}$	$C_{18}H_{32}O_7$	360.48	H	7(-4H)	-	H	
Mono-rhamno-di-lipidic congeners								
7	Rha-$C_{8:0}$-$C_{8:0}$	$C_{22}H_{42}O_8$	448.55	H	1	1	H	
8	Rha-$C_{8:0}$-$C_{10:1}$	$C_{24}H_{42}O_8$	474.58	H	1	3(-2H)	H	
9	Rha-$C_{10:0}$-$C_{8:0}$	$C_{24}H_{46}O_8$	474.58	H	3(-2H)	1	H	
10	Rha-$C_{8:0}$-$C_{10:0}$	$C_{24}H_{46}O_8$	476.60	H	1	3	H	
11	Rha-$C_{10:0}$-$C_{8:0}$	$C_{24}H_{46}O_8$	476.60	H	3	1	H	
12	Rha-$C_{10:0}$-$C_{10:1}$	$C_{26}H_{46}O_8$	502.64	H	3	3(-2H)	H	
13	Rha-$C_{10:1}$-$C_{10:1}$	$C_{26}H_{44}O_8$	504.65	H	3	3	H	
14	Rha-$C_{8:0}$-$C_{12:0}$	$C_{26}H_{50}O_8$	504.65	H	1	5	H	
15	Rha-$C_{12:0}$-$C_{8:0}$	$C_{26}H_{50}O_8$	504.65	H	5	1	H	
16	Rha-$C_{10:0}$-$C_{12:1}$	$C_{28}H_{50}O_8$	530.69	H	3	5(-2H)	H	
17	Rha-$C_{12:1}$-$C_{10:0}$	$C_{28}H_{50}O_8$	530.69	H	5(-2H)	3	H	
18	Rha-$C_{10:0}$-$C_{12:0}$	$C_{28}H_{52}O_8$	532.71	H	3	5	H	
19	Rha-$C_{12:0}$-$C_{10:0}$	$C_{28}H_{52}O_8$	532.71	H	5	3	H	
20	Rha-$C_{10:0}$-$C_{14:1}$*	$C_{30}H_{54}O_8$	558.74	H	3	7(-2H)	H	
21	Rha-$C_{14:1}$-$C_{10:0}$*	$C_{30}H_{54}O_8$	558.74	H	5	5(-2H)	H	
22	Rha-$C_{12:0}$-$C_{12:0}$*	$C_{30}H_{56}O_8$	560.76	H	3	7	H	
23	Rha-$C_{12:0}$-$C_{12:0}$	$C_{30}H_{56}O_8$	560.76	H	5	5	H	
24	Rha-$C_{12:0}$-$C_{14:0}$	$C_{32}H_{60}O_8$	588.81	H	5	7	H	
25	Rha-$C_{14:0}$-$C_{14:0}$	$C_{34}H_{64}O_8$	616.87	H	7	7	H	
26	Rha-$C_{14:0}$-$C_{16:0}$	$C_{36}H_{68}O_8$	644.92	H	7	9	H	
27	Rha-$C_{16:0}$-$C_{16:0}$	$C_{38}H_{72}O_8$	672.97	H	9	9	H	
28	Rha-$C_{12:0}$-$C_{12:0}$-CH_3	$C_{31}H_{58}O_8$	518.68	H	3	3	CH_3	b: α-decenoyl group
Di-rhamno-mono-lipidic congeners								
30	Rha-Rha-$C_{8:0}$	$C_{20}H_{38}O_{11}$	452.49	H	1	-	H	
31	Rha-Rha-$C_{10:0}$	$C_{22}H_{42}O_{11}$	480.55	H	3	-	H	
32	Rha-Rha-$C_{10:1}$	$C_{22}H_{40}O_{11}$	506.56	H	5(-2H)	-	H	
33	Rha-Rha-$C_{12:0}$	$C_{24}H_{46}O_{11}$	508.60	H	5	-	H	
34	Rha-Rha-C_{14}	$C_{26}H_{48}O_{11}$	536.65	H	7	-	H	
Di-rhamno-di-lipidic congeners								
35	Rha-Rha-$C_{8:0}$-$C_{8:0}$	$C_{34}H_{62}O_{12}$	594.69	H	1	1	H	
36	Rha-Rha-$C_{10:0}$-$C_{10:0}$	$C_{38}H_{70}O_{12}$	622.74	H	1	3	H	
37	Rha-Rha-$C_{10:0}$-$C_{8:0}$	$C_{36}H_{66}O_{12}$	622.74	H	3	1	H	
38	Rha-Rha-$C_{10:0}$-$C_{10:1}$	$C_{38}H_{68}O_{12}$	648.76	H	3	3(-2H)	H	
39	Rha-Rha-$C_{10:1}$-$C_{10:0}$	$C_{38}H_{70}O_{12}$	650.79	H	3	3	H	
40	Rha-Rha-$C_{8:0}$-$C_{12:1}$	$C_{38}H_{68}O_{12}$	648.76	H	1	5(-2H)	H	
41	Rha-Rha-$C_{12:1}$-$C_{8:0}$	$C_{38}H_{68}O_{12}$	648.76	H	5(-2H)	1	H	
42	Rha-Rha-$C_{10:0}$-$C_{12:1}$	$C_{40}H_{70}O_{12}$	676.83	H	3	5(-2H)	H	
43	Rha-Rha-$C_{12:1}$-$C_{10:0}$	$C_{40}H_{70}O_{12}$	676.83	H	5(-2H)	3	H	
44	Rha-Rha-$C_{10:0}$-$C_{12:0}$	$C_{40}H_{72}O_{12}$	678.84	H	3	5	H	
45	Rha-Rha-$C_{12:0}$-$C_{10:0}$	$C_{40}H_{72}O_{12}$	678.84	H	5	3	H	
46	Rha-Rha-$C_{10:0}$-$C_{14:1}$	$C_{42}H_{74}O_{12}$	704.89	H	3	7(-2H)	H	
47	Rha-Rha-$C_{14:1}$-$C_{10:0}$	$C_{42}H_{74}O_{12}$	704.89	H	5	5(-2H)	H	
48	Rha-Rha-$C_{12:1}$-$C_{12:0}$	$C_{42}H_{74}O_{12}$	704.89	H	5(-2H)	5	H	
49	Rha-Rha-$C_{12:0}$-$C_{12:0}$	$C_{42}H_{76}O_{12}$	706.90	H	5	5	H	
50	Rha-Rha-$C_{12:0}$-$C_{14:0}$	$C_{44}H_{80}O_{12}$	734.95	H	5	7	H	
51	Rha-Rha-$C_{14:0}$-$C_{12:0}$	$C_{44}H_{80}O_{12}$	734.95	H	7	5	H	
52	Rha-Rha-$C_{14:0}$-$C_{14:0}$	$C_{46}H_{84}O_{12}$	763.00	H	7	7	H	
53	Rha-Rha-$C_{14:0}$-$C_{16:0}$	$C_{48}H_{88}O_{12}$	791.06	H	7	9	H	
54	Rha-Rha-$C_{16:0}$-$C_{14:0}$	$C_{48}H_{88}O_{12}$	791.06	H	9	7	H	
55	Rha-Rha-$C_{16:0}$-$C_{16:0}$	$C_{50}H_{92}O_{12}$	819.11	H	9	9	H	
56	Rha-Rha-C_{14}-C_{12}-C_{14}*	$C_{52}H_{98}O_{12}$	869.36	Structure drawn separately*				
57	Rha-Rha-$C_{12:0}$-$C_{12:0}$-CH_3	$C_{37}H_{70}O_{12}$	664.82	H	3	3	CH_3	
58	Decenoyl-Rha-Rha-C_{14}-C_{16}	$C_{48}H_{91}O_{13}$	883.03	b	3	3	H	d

FIG. 4

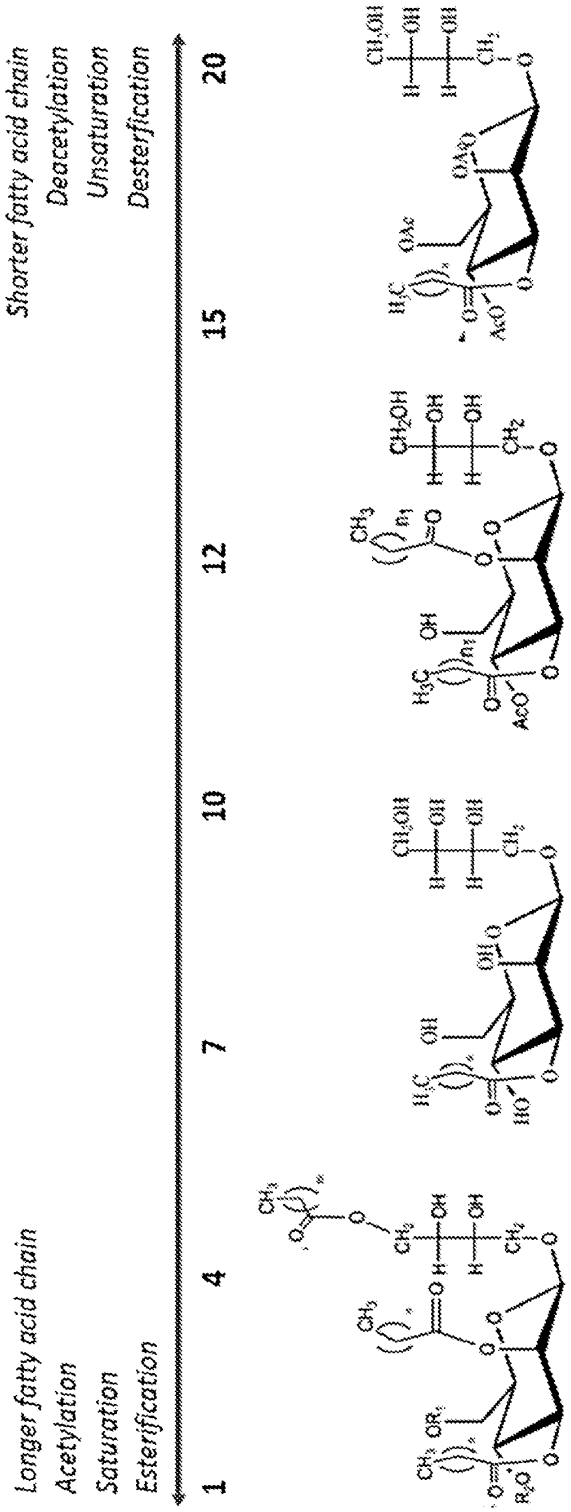

Longer fatty acid chain
Acetylation
Saturation
Esterification
Shorter fatty acid chain
Deacetylation
Unsaturation
Desterification
1
4
7
10
12
15
20

FIG. 5

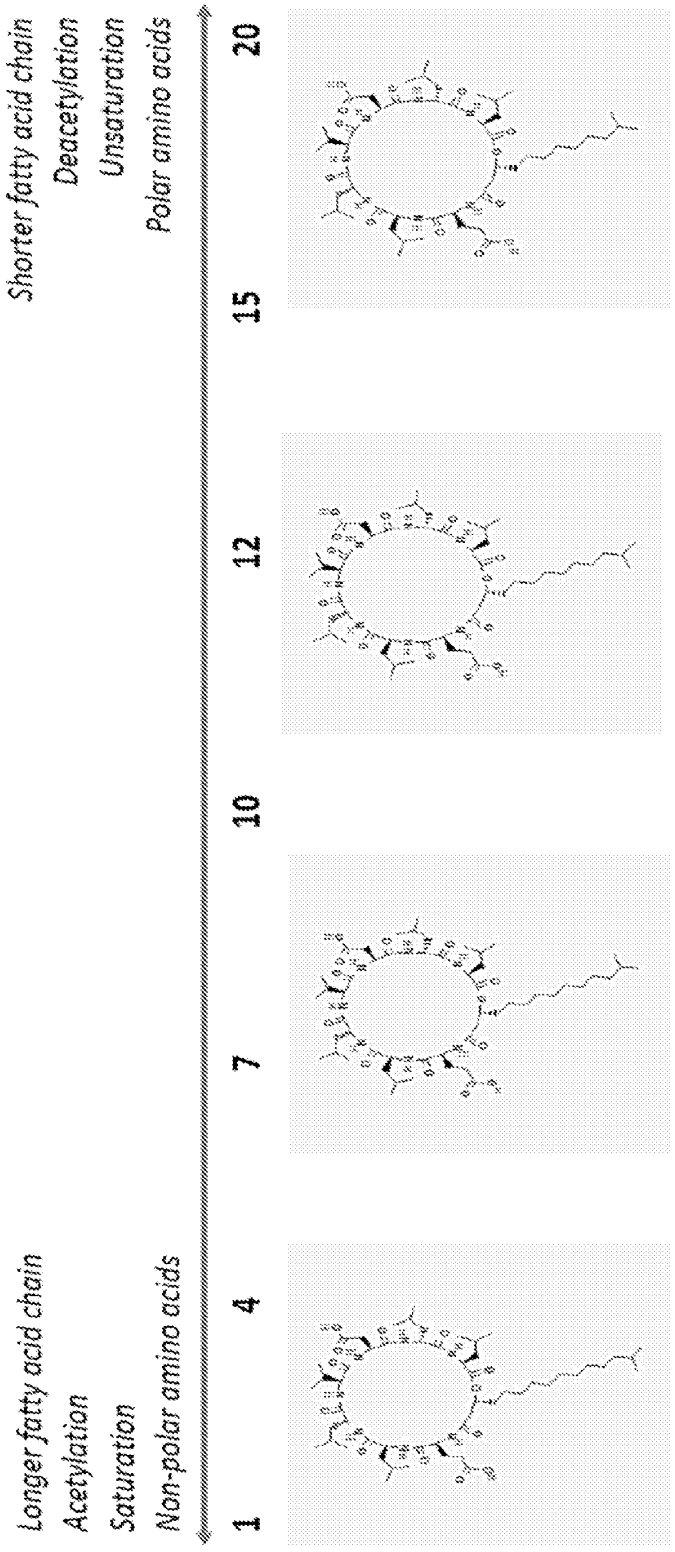

Longer fatty acid chain
Acetylation
Saturation
Non-polar amino acids
Shorter fatty acid chain
Deacetylation
Unsaturation
Polar amino acids
1
4
7
10
12
15
20

FIG. 6

HLB range	1-3	3-6	7-9	10-14	13-18	19-22
	Predominantly Lactonic Sophorolipid			Predominantly Linear Sophorolipid		
Petroleum Industry	Hydrate inhibition	Transportation of extra heavy oil by making w/o emulsion	Enhanced oil recovery	Cleaning of oil tanks and pipelines	Paraffin/asphaltene inhibition	Corrosion inhibition properties
Cleaning Products	Antifoaming agent	Antimicrobial agent	Spray Dried Detergents	Active ingredient in HI&I Cleaners	Emulsifier for formulations (o/w)	Foaming agent
Agriculture	Wetting of water repellent soil	Biopesticide	Fertilizer	Water retention	Washing of soil from pollutants	Antiviral treatment
Livestock and Pets Husbandry	Relieves the symptoms of excessive gas	Antimicrobial treatment	Enhanced digestion of nutrients	Anti-nematode treatment	Antiviral treatment	Antiviral treatment
Construction	Emulsification of oil paints	Air and water resistant cement	Lubricant for metal constructions	Stable asphalt emulsions	Corrosion inhibition	Additive to glue
Personal Care	Anti-foaming agent	Emulsifier, antimicrobial agent	Skin related disease treatment	Moisturizing gent	Anti-age spot products	Foaming agent
Food	Anti-foaming agent for juices	Preservative	Emulsifier (w/o)	Consistency agent	Emulsifier (o/w)	Antiviral preservative
Medicine and Pharmaceuticals	Oil-based liposomal drugs	Antimicrobial agent	Anti-inflammatory agent	Coating for nanocapsules	Emulsifier	Antiviral agent
Solving Climate Change Problems	Treatment of sewage and landfills	Reduction of methane emission by livestock	Carbon sequestration	Nitrous oxide reduction	Bioremediation	Metal content reduction in soil

FIG. 7