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ALKYL POLYGLUCOSIDES

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1. Description

Alkyl polyglucosides (APG) are nonionic surfactants made from renewable raw materials-glucose derived from corn, and fatty alcohols from coconut and palm kernel oils. They exhibit very good wetting, dispersing, and surface tension reduction properties for increased soil removal and emulsification. Excellent caustic stability, builder compatibility, detergency and hydrotrope ability properties combine to offer the formulator greater flexibility and better cost performance.

Alkyl polyglycosides represent a technology advantage in manufacture of mild dishwashing agents combined with excellent cleaning performance. The synergistic effects of alkyl polyglucosides with other commonly used surfactants yield a performance improvement that can be the basis for a reduction of surfactant content while maintaining the same performance level.

Alkyl polyglucosides are very mild, low in toxicity, and readily biodegradable due to their natural chemistry.

2. Specification and product characteristics:

2.1 APG-0810

Appearance:	A light yellow, turbid and ropy water solution
Carbon(C) number :	C8 -- C10
Solid matter(wt%) :	50-53%
pH :	11.5-12.5
water content :	47-50%
Fatty alcohol residue (wt%):	≤1%
Viscosity(25℃):	＜5００mPa.s
Density(g/cm3, 25℃) :	1.07-1.20
Ash:	＜2%

Characteristics:

* Good hydration
* Good resolvable in cold water
* Good solubility in high concentration of alkaline or electrolyte solution.
* Excellent compatibility with skin

2.2 APG-1214

Appearance:	A light yellow, turbid and ropy water solution
Carbon(C) number :	C12— C14
Solid matter(wt%) :	50-53%
pH :	11.5-12.5

water content (wt%) : 47-50%
Fatty alcohol residue: ≤1%
Viscosity(25℃): >=2000mPa.s
Ash: ＜2%

Characteristic:

*** Excellent effect of thickening , foaming, and foam-stabilify.**
*** Excellent coordinated action with other surfactants.**
*** Excellent compatibility with skin**

2.3 APG-0814

Appearance: A light yellow, turbid and ropy water solution
Carbon(C) number : C8— C14
Solid matter(wt%) : 50-53%
pH : 11.5-12.5
water content (wt%) : 47-50%
Fatty alcohol residue: ≤1%
Viscosity(25℃): >=1000mPa.s
Ash: ＜2%

[Remarks]: APG-1214 is more hydrophobic than APG-0810 because of long carbon chain (C12-C14) in its structure. So APG-1214 exhibits better washing and emulsifying ability than APG-0810, While APG-0810 is more suitable in aqueous formulation.
APG-0814 is a compound of APG-0810 and APG-1214, so APG-0814 collect the advantage of APG-0810 and APG-1214.

[CAUTION]

(1). Crystals appear when store high concentration of APG-1214 below 30℃. But it doesn't affect the quality and use of this product. Uniform liquid obtains when slight heat prior to use.

(2). Preservative effect obtains by increasing the PH value APG product. So preservatives are not contained in APG.

(3). Characteristic turbidity appears under high PH value. When added to the formulation, adjust PH to below 8, the turbidity disappears and a clear ,transparent product is obtained.

3. The application characteristics of APG

3.1 Interfacial Characteristics

APG has an excellent surface activity, and this activity increases when the length of Carbon chain increases.

	APG-0810	APG-1214
CMC % AS	0.031	0.002
Surface tension,25℃,%AS	23.7	23.4

3.2 Foam Characteristics

As a non-ionic surfactant, the foaming ability of APG is affected by the hardness of water. When increase the hardness of water, the forming ability of short-alkyl-chain APG is stronger than that of long-chain APGs.

But in combination with anion surfactants, the forming ability and foam stability of both short and Long-chain APGs increase markedly.

3.3 Viscosity

The aqueous solution of APG doesn't thicken when add sodium chloride, but the viscosity increases when add alkyl polyglucosides, eg. APG-1214, to most anion surfactants, and viscosity also increases when add electrolyte.

High viscosity can be obtained even in low salt concentration when APG is combined with AES.

3.4 Application

3.4.1 APGs are very suitable in the cleanser of hard surfaces, such as bathroom cleanser and glass cleanser because of their excellent hydration, little water spot and little residue.

3.4.2 Because of its strong tolerance to strong alkali, APG is very important in preparing high alkaline industrial and public sanitation cleansers. APG-0810 dissolves in high concentration of sodium hydroxide and keeps stable. It can also increase the solubility of non-ionic surfactant in high alkaline solution.

3.4.3 The another important characteristics of APG is that: it still has excellent hydration in high concentration of electrolyte solution. So APG can increase the solubility of many components, including many adjuvant materials, when in high concentration of salt solution.

For example, by using APG-0810, a new pesticide emulsifier and a new textile adjuvant containing high concentration of salt have been developed.

4. Formulation

4.1 Lotion

APG-1214	10.0
AES	5.0
C12-fatty acid diethanolamide	5.0
Cocamine Oxide	2.0
Sodium p-toluensulfonate	0.5

4.2 Dishware Cleanser

	A	B	C	D
LAS (50%)	17.5	16.2	13.3	14.3
AES	8.6	13.7	11.3	12.1
APG-1214	3.0	3.0	5.6	6.0
alkylamidopropyl Beatine(30%)	5.0		2.3	2.5
Ethanol	1.9			
Preservatives	.01	0.1	0.1	0.1
Coconut Diethanolamide (100%)		0.8		
Octyl alcohol ether (EO=10)			1.0	
NaCl		0.15		0.2

4.3 Shampoo

(1)

APG-1214 50%	12.0
Cocoamidopropyl Beatine(30%)	7.0
Lauryl ether disodium sulfo-succinate 40%	8.0
AES	1.5
Polyquaternium-10	0.2
Water, preservative	ADD TO 100
pH	5.5

(2)

APG-0814	5
AES	27.0
Hydrolyzed collagen	2.0
AEO(2)	3
Pearlescing concentrate	3
NaCl	0.5
Perfume	q.s.

Water	Add to 100
pH	5.5

(3)

APG-0814	5
AES	25.0
Hydrolyzed almond albumin	2.0
Pearlescing concentrate	5
NaCl	2.5
Perfume	q.s.
Water	Add to 100
pH	5.5

(4)

APG-0814	5
AES	25
Hydrolyzed collagen	3.0
AEO(2)	1
Perfume	q.s.
Water	Add to 100
pH	5.5

4.4 Facial Lotion

APG-1214 50%	12.0
AES 30%	2.0
Cocoamidopropyl Beatine(30%)	1.5
Polyacrylic acid ester	0.8
Aloe	0.2
Allantoin	0.2
Polyquaternium-10	0.2
Water, preservative	Add to 100

4.5 Facial Cleanser

(1)

APG-0814	10.0
AES	3.6
Hydrolyzed wheat albumin ramification	0.5
Carboxylate of pantothenic acid	0.2
allantoin	0.2

Water, preservative	Add to 100
pH	5.5

(2)

APG-0814	20.0
AES	15
Hydrolyzed almond albumin	2
AEO(2)	0.5
Water, preservative	Add to 100
pH	5.5

(3)

APG-0814	12.0
AES	2
coconut oil sodium acetic acid imidazole	1.5
Acrylic acid polymer	0.8
Aloe	0.2
Polyquaternium	0.1

4.5 Cleanser for hard surface

4.5.1 General cleanser

	Neutral	Acidic
APG-0810	1.8	3.5
alkylamidopropyl Beatine	3.5	
Octyl ether(4 EO)	2.8	1.7
Ethanol	3.0	
Citric acid		9.6
Acetic acid		2.4
pH	6.5--7.5	2.0—2.5

4.5.2 Cleanser for bathroom and glass

Bathroom cleanser		Glass cleanser	
。APG-0810	6.0	APG-0810	6.0
Sodium citrate	1.5	Isopropyl alcohol	5.0
Citric acid	3.0	Ammonium water	0.2
Isopropyl alcohol	2.0	EDTA	2.5
pH	3.5	pH	10.5