

Company: SynthoChem

CEO: Saumya Gupta

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Chemical Formula: $R(OCH_2CH(OH)CH_2)_n(OGI)_c$ where R = C8 to C10 alkyl chain and GI = glucose unit

Chemical Name: Alkyl Polyglucoside (APG)

Use case:

a. What is the use of this compound?

APGs (Alkyl Polyglucoside) are a renewable, biodegradable, and effective type of non-ionic surfactant derived from corn and potato starch. They have numerous applications across industries, including personal care, household cleaning, agricultural chemicals, industrial cleaning, and the oil and gas industry. They provide mild and efficient cleaning properties without stripping natural oils or leaving residue, and they can improve the effectiveness of other chemicals. APGs are a popular choice for environmentally conscious companies.

b. Are there any alternatives to this compound? Name a few.

1. Sodium Lauryl Sulfate
2. Sodium Lauryl Glucose Carboxylate
3. Coco Glucoside

c. Why this compound is superior to its alternatives?

1. Sodium Lauryl Sulfate (SLS): It is effective in removing dirt and oil from surfaces but is less environmentally friendly than APGs.
2. Coco Glucoside: It is similar to APGs in terms of biodegradability and mildness but may not provide the same level of foaming properties.
3. Sodium Lauryl Glucose Carboxylate: APGs generally provide better foaming properties than SLGC, APGs can provide higher viscosity at lower concentrations than SLGC, which can help to reduce the overall amount of surfactant needed in a formulation.

d. Is this compound imported in India? What is the magnitude of imports?

India imported over 1,500 metric tons of APGs in 2020, with China being the largest supplier, accounting for over 70% of the total imports. The value of APG imports into India in 2020 was over \$6 million. The demand for APGs in India is expected to grow steadily in the coming years due to the increasing use of natural and eco-friendly ingredients in various industries.

Economic feasibility:

1. What input raw materials are needed for its synthesis?

1. Glucose
2. Fatty Alcohol (C8-C10)
3. HCl (for acid catalysis)
4. Water (solvent)

2. Provide preliminary economic feasibility based on cost of raw materials, solvents and product selling price.

- Glucose available at INR 38.5/Kg
- Fatty Alcohol available at INR 100/Kg
- HCl available at INR 2/Kg
- Water available at INR 0.015/Kg
- Alkyl Polyglucoside sold at INR 160/Kg
- Net Reaction is 1 mole Glucose + 2 moles Fatty Acid --> 1 unit APG + residue
- Product Yield is between 50 to 80 percent (taking it 65 percent for calculations)
- Taking molar mass of fatty alcohol same as of octanol

Calculations-

- $180 \text{ g glucose} + (130 \times 2) \text{ g fatty alcohol yields } (65/100) \times (180 + (130 \times 2)) = 286 \text{ g of product}$
- $\text{Expenditure} = ((180 \times 38.5) + (260 \times 100))/1000 = \text{INR } 32.93 \text{ per } 286 \text{ g of product}$
- $\text{Income} = (286/1000) \times 160 = \text{INR } 45.76 \text{ per } 286 \text{ g of product}$
- $\text{Net profit} = 45.76 - 32.93 = \text{INR } 12.83 \text{ per } 286 \text{ g of product}$
- $\text{Net profit per Kg product} = 12.86 \times 1000/286 = \text{INR } 44.86$

Therefore, net profit per Kilogram of Alkyl Polyglucoside produced is approximately INR 45

References:

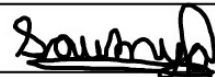
Uses: <https://www.irocoatingadditive.com/alkyl-polyglucoside-applications-industry/>

Import: <https://www.seair.co.in/alkyl-polyglycoside-import-data.aspx>

List the contributions of each author:

- Prerna Singh Chauhan - has done the research for the chemical Alkyl Polyglucoside and prepared the use case for the same.
- Pulkit Sharma – has check economic feasibility of the reaction based on cost of raw materials and solvent and selling price of product.

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Market Analysis Report

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