Company: GreenovateX

CEO: Aditya Singh

Report Authors: Sunny Kumar, Divyansh Gupta

Chemical Formula: Sodium Lauroamphoacetate

Chemical Name:$C_{18}H_{38}N_2NaO_3$

Use case:

a. What is the use of this compound?

1. Personal Care & Cosmetic Applications

Baby Shampoos & Body Washes – Provides gentle, non-irritating cleansing, reducing skin and eye irritation.
Facial Cleansers & Micellar Waters – Works as a mild foaming agent, removing dirt, oil, and makeup while maintaining moisture.
Shampoos & Conditioners – Enhances foam stability, conditions hair, and reduces harshness when combined with stronger surfactants.
Shaving Creams & Foams – Creates a smooth lather for easy razor glide while minimizing skin irritation.
Bath Foams & Bubble Baths – Boosts foam formation for a long-lasting and luxurious bathing experience.

2. Industrial & Household Applications

Mild Household Cleaners – Provides gentle yet effective cleansing in hand washes and dishwashing liquids, minimizing skin dryness and performing well in hard water.
Textile & Leather Processing – Acts as a wetting agent for uniform dye absorption in textiles and aids in leather softening and conditioning.
Emulsion Polymerization – Functions as an emulsifier and stabilizer in synthetic rubber, plastic, and latex production, ensuring consistency and quality.

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

- Yes, there are several alternatives to Sodium Lauroamphoacetate that are used in various applications, especially in personal care and cleaning products.
  1.Cocamidopropyl Betaine (CAPB)
- **Usage:** Commonly used in shampoos, body washes, and facial cleansers as a foam booster and mild surfactant.

- **Difference:** While both CAPB and Sodium Lauroamphoacetate are amphoteric surfactants, CAPB has stronger viscosity-building properties and is slightly less mild, making it less suitable for ultra-sensitive skin formulations.

2. Sodium Cocoyl Isethionate (SCI)

- **Usage:** A sulfate-free surfactant widely used in cleansing bars, sulfate-free shampoos, and facial cleansers due to its creamy lather and mildness.
- **Difference:** Unlike Sodium Lauroamphoacetate, SCI is **anionic**, meaning it has stronger cleansing power but is less conditioning. It is also more commonly used in solid formulations rather than liquid ones.

3. Decyl Glucoside

- **Usage:** A **non-ionic** surfactant derived from plant sources, often found in baby care products, sulfate-free shampoos, and eco-friendly household cleaners.
- **Difference:** Compared to Sodium Lauroamphoacetate, Decyl Glucoside has lower foaming ability but superior biodegradability and is often preferred for **natural and organic** formulations.

c. Why this compound is superior to its alternatives?

Sodium Lauroamphoacetate stands out due to its unique balance of **mildness, foaming ability, compatibility with other surfactants, and eco-friendliness.** Compared to alternatives like **Cocamidopropyl Betaine (CAPB), Sodium Cocoyl Isethionate (SCI), and Decyl Glucoside,** it offers several advantages, making it a preferred choice in personal care and household formulations.

1. Exceptionally Mild & Non-Irritating

Unlike **Cocamidopropyl Betaine (CAPB),** which can cause skin sensitivity due to impurities like **dimethylaminopropylamine (DMAPA),** Sodium Lauroamphoacetate is far gentler.

Ideal for **baby care, sensitive skin, and sulfate-free formulations** due to its minimal irritation properties.

2. Balanced Foaming & Cleansing

Compared to **Sodium Cocoyl Isethionate (SCI),** which produces a rich lather but has **low water solubility**, Sodium Lauroamphoacetate forms a **stable, moderate foam** in both **liquid and solid formulations.**
Enhances **cleansing efficiency** without excessive dryness.

3. Better Compatibility with Other Surfactants

- Unlike **Decyl Glucoside,** which has **limited foaming capacity**, Sodium Lauroamphoacetate **works synergistically** with both **anionic (e.g., SLS) and non-ionic surfactants** to improve performance while minimizing irritation.
- Allows for **gentler formulations** with effective cleansing.

4. Biodegradable & Eco-Friendly

- Similar to **Decyl Glucoside and SCI,** it is **biodegradable**, but it also offers superior **conditioning properties**, making it ideal for both **personal care and household cleaning products.**
- Aligns with **sustainable beauty trends** and environmental concerns.

---

5. Market Superiority & Growing Demand

Rising Demand for Sulfate-Free Products – Consumers prefer **sulfate-free surfactants** to avoid skin irritation in shampoos, body washes, and facial cleansers.

Clean Beauty & Natural Ingredients Trend – Derived from **coconut oil**, it fits the trend of **organic, eco-friendly beauty** with **gentle cleansing properties**.

Personal Care & Cosmetics Industry Growth – The **beauty industry boom** in **Asia Pacific & North America** fuels the demand for **mild, sulfate-free surfactants.**

Sustainability & Eco-Friendly Focus – Brands prefer **biodegradable, sustainable ingredients**, making **Sodium Lauroamphoacetate an attractive choice** for green formulations.

Regulatory & Ethical Influences – Stricter **regulations** and demand for **cruelty-free, vegan, and hypoallergenic** products boost its **global market presence.**

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

Yes, Sodium Lauroamphoacetate is imported into India. The magnitude of imports is as follows:

1. Total Import Data:

- Total Value: $156,396

- Total Quantity Imported: 58,330 units
- Average Price per Unit: $2.68
- Average Value per Shipment: $5,792

2. Source Countries:

- Thailand: $155,977 (Major supplier)
- China: $419 (Minor supplier)

3. Major Port of Entry:

- Nhava Sheva Port (Jawaharlal Nehru Port, Maharashtra) – Largest Container Port in India
- Delhi Air Cargo – Small volume imports

Economic feasibility:

a. **What input raw materials are needed for its synthesis (same as reported in the Patent application)?**

- Sodium Lauroamphoacetate is synthesized through a **two-step process** involving the reaction of **lauric acid, aminoethylethanolamine (AEEA), and sodium chloroacetate.** The key raw materials used in its production are:

1. Lauric Acid (C12H24O2)

Source: Derived from coconut oil or palm kernel oil.
Role: Acts as the **hydrophobic fatty acid component**, forming the surfactant's **lipophilic tail**.
Reaction: In the **first step**, lauric acid reacts with AEEA to form an **amide intermediate**.

2. Aminoethylethanolamine (AEEA) (C4H12N2O)

Role: Provides the **hydrophilic amine group** necessary for the formation of the imidazoline ring.
Reaction: Reacts with lauric acid to form an **amide intermediate**, which undergoes **cyclization** upon heating to generate an **imidazoline structure**.

3. Sodium Chloroacetate (C2H2ClNaO2)

Role: Introduces the **zwitterionic carboxylate (-COO⁻) group**, which makes the compound a **mild amphoteric surfactant**.

Reaction: The imidazoline structure reacts with **one equivalent** of sodium chloroacetate to form **sodium lauroamphoacetate**.
If **two equivalents** are used, the **di-acetate form** (Di-Sodium Lauroamphoacetate) is obtained.

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

Preliminary Economic Feasibility Analysis of Aminoethyl Ethanolamine (AEEA)

Import Data for Aminoethyl Ethanolamine (AEEA)

- **Total Value of Imports in India:** $616,801
- **Total Quantity Imported:** 238,400 units
- **Average Price per Unit:** $2.59
- **Average Value per Shipment:** $41,120
- **Top Supplier:** Sweden (Total value: $616,801)
- **Top Port of Discharge:** Nhava Sheva Sea ($616,801)

Economic Feasibility Considerations

1. **Raw Material Costs:**
   - The unit price of **AEEA is $2.59**, which is significantly **higher** compared to other raw materials.
   - The **costly nature of AEEA** indicates it may be a **critical input** in the production process.
2. **Supply Chain & Logistics:**
   - **Major Supplier: Sweden**, meaning **dependency on a single country** for imports.
   - **Port of Discharge: Nhava Sheva Sea**, which is India's **largest container port**, ensuring **reliable import logistics**.
   - **High-value shipments ($41,120 avg.)** suggest bulk procurement to minimize costs.

3. **Product Pricing & Market Viability:**
   - If the final **product selling price** is **significantly higher** than the cost of raw materials (AEEA + others), then **profitability is feasible**.
   - The **high unit price** suggests AEEA is likely used in specialized chemical or industrial applications, meaning the **market should support premium pricing.**

Preliminary Economic Feasibility Analysis of Lauric Acid

Import Data for Lauric Acid

- **Total Value of Imports in India:** $181,419,670
- **Total Quantity Imported:** 153,272,638 units
- **Average Price per Unit:** $1.18
- **Average Value per Shipment:** $55,446

Supply Chain & Logistics

- **Top Suppliers:**
  - Malaysia: **$108,600,371**
  - Indonesia: **$72,524,566**
  - Germany: **$124,331**
- **Top Ports of Discharge:**
  - Nhava Sheva Sea: **$74,817,018**
  - Chennai Sea: **$45,525,821**
  - Ludhiana: **$31,102,405**
- **Ports of Loading:**
  - Jawaharlal Nehru Port
  - Salalah Port
  - Mundra
  - Cagliari

Economic Feasibility Considerations

1. Raw Material Costs:
   - The unit price of **Lauric Acid is $1.18**, which is **moderate** compared to other imported materials like AEEA ($2.59) but higher than Sodium Acetate (~$0.23).
   - This suggests Lauric Acid is a relatively **valuable** but **affordable** input.
2. Supply Chain & Logistics Efficiency:
   - **Diversified supplier base** with major contributions from **Malaysia and Indonesia**, reducing dependency on a single country.
   - **Multiple ports of discharge** (Nhava Sheva, Chennai, Ludhiana) ensure **distribution flexibility**, reducing bottlenecks.
   - **Multiple loading ports** (Jawaharlal Nehru, Salalah, Mundra, Cagliari) indicate **well-established global trade routes**, minimizing transportation risks.
3. Market Viability & Demand:
   - **High import value (~$181 million)** suggests **strong domestic demand**, making it a **commercially viable product.**
   - Lauric Acid is widely used in **cosmetics, detergents, and pharmaceuticals**, which are **high-demand industries** in India.
4. Cost Comparison with Other Raw Materials:
   - **Sodium Acetate:** $0.23/unit
   - **Aminoethyl Ethanolamine (AEEA):** $2.59/unit
   - **Lauric Acid:** $1.18/unit → **Mid-range cost, making it economically viable**

References: Provide references/web links for your data.

https://www.zauba.com/lauric-acid-exports-from-india-ut4cpq2awx8r

https://www.zauba.com/importanalysis-AMINOETHYLETHANOLAMINE/hs-code-29221990-report.html

https://www.zauba.com/data-for-53313-pg49wleuvz6t

https://www.zauba.com/data-for-57035-fktqn7sz3obc

http://datavagyanik.com

List the contributions of each author: Sunny Kumar

- Designed and implemented the use case analysis of Sodium Lauroamphoacetate, detailing its applications in personal care, cosmetics, and industrial uses.
- Conducted a comparative analysis of Sodium Lauroamphoacetate with alternative compounds, highlighting its superior qualities such as mildness, foaming ability, compatibility with other surfactants, and eco-friendliness.
- Provided insights into market trends, including the growing demand for sulphate-free and sustainable products, and aligned the findings with industry standards.

List the contributions of each author: Divyansh Gupta

- Designed and implemented the economic feasibility analysis of Sodium Lauroamphoacetate, including raw material cost analysis, supply chain logistics, and market viability assessment.
- Researched and analysed import data for key raw materials like Aminoethyl Ethanolamine (AEEA) and Lauric Acid, evaluating their cost and availability.
- Provided a preliminary economic feasibility assessment based on raw material costs, solvents, and the potential selling price of the product, ensuring alignment with company goals and market demand.

Sign the pdf and upload.

Name	Roll No	Signature
CEO Name	Aditya Singh	Aditya Singh
First author Name	Sunny Kumar	Sunny Kumar
Second author Name	Divyansh Gupta	Divyansh