Company: PetroProtons Pvt. Ltd.

CEO: Atharva Deshmukh

Report Authors: Rohit Kumar (210873) , Nitin Babu (210677) , Bhanupratap (210263) , Narottam Kumar Pankaj (210652).

Chemical Formula: $(C_2H_4O)_nCH_4O$

Chemical Name: Methoxy polyethylene glycol (mPEG)

Use case:

What is the use of this compound?

- Pharmaceutical industry
- Cosmetics and personal care products
- Food industry
- Textile industry
- Industrial applications

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

- Polyethylene glycol (PEG)
- Polyvinyl alcohol (PVA)
- Polyethylene oxide (PEO)
- Polysorbate 80
- Hydroxypropyl methylcellulose (HPMC)

Why this compound is superior to its alternatives?

- Biocompatibility
- Water solubility
- Low toxicity
- Low viscosity
- Stability

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

Yes, MPEG (Methoxy polyethylene glycol) is imported in India by various companies for use in pharmaceuticals, cosmetics, and other industries. India imports MPEG from various countries, including China, the USA, Germany, and South Korea, among others. The import of MPEG is subject to various regulations and guidelines set by the Indian government and the regulatory authorities.

Economic feasibility:

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

- Ethylene oxide (EO)
- Methanol
- Common catalysts include potassium hydroxide, sodium hydroxide and tetramethylammonium hydroxide.
- Purification agents including activated carbon, silica gel, and ion exchange resins.

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

The current market price of ethylene oxide is around $1000-$1200 per tonne, while the current market price of methanol is around $300-$400 per tonne. Other costs associated with the production of MPEG include catalysts, purification agents, and energy costs.

Assuming a production capacity of 1000 tonnes per year, the total raw material cost for producing MPEG will be around $1.3 million - $1.6 million per year. In addition to raw material costs, other costs, such as labour, overheads, and equipment maintenance, will also need to be considered.

The selling price of MPEG can vary depending on the purity and grade of the product. However, the current market price for MPEG is around $2.5-$3.5 per kilogram. Assuming a selling price of $3 per kilogram, the annual revenue from producing 1000 tonnes of MPEG would be around $3 million.

References:

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2. https://www.researchgate.net/figure/Synthetic-route-and-chemical-structure-of-a-mPEG-acid-and-b-mPEG-g-chitosan_fig1_299499091
3. https://www.marketwatch.com/press-release/global-methoxy-polyethylene-glycol-mpeg-market-forecast-to-2028-top-companies-trends-and-growth-factors-and-detail-research-for-business-development-2023-03-06
4. https://polypure.com/products/mpeg

List the contributions of each author:

Rohit Kumar (Author 1) carried out the market research for chemical trade data.

Rohit Kumar (Author 1) prepared the use case.

Nitin Babu (Author 2) , Bhanupratap (Author 3) and Narottam Kumar Pankaj (Author 4) looked at economic feasibility.

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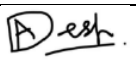
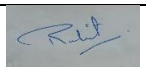
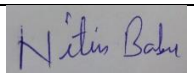
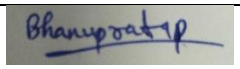
CEO Name: Atharva Deshmukh	210231	
First author: Rohit Kumar	210873	
Second author: Nitin Babu	210677	
Third author: Bhanupratap	210263	
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