Company: CHEMIEVOLVE INDUSTRIES

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Chemical Formula:$(C_6H_4CO_2H)_2$

Chemical Name:DIPHENIC ACID

Use case:

- **USES**
  - Diphenic acid is used in the synthesis of dyes and as a pharmaceutical intermediate. It's also found in many herbs and food components, and its derivatives have therapeutic properties that may help lower the risk of chronic diseases. Diphenic acid derivatives are found in fruits like strawberries, raspberries, and blackberries.

- **ALTERNATIVES**
  - **Phthalic acid (1,2-benzenedicarboxylic acid):** Similar in structure to diphenic acid, phthalic acid is often used in the synthesis of polymers, such as polyesters, alkyd resins, and polyols.
  - **Isophthalic acid (1,3-benzenedicarboxylic acid):** Isophthalic acid is another isomer of phthalic acid and can be used in the production of polyesters, resins, and certain pharmaceuticals.
  - **Terephthalic acid (1,4-benzene dicarboxylic acid):** Yet another isomer of phthalic acid, terephthalic acid is commonly used in the production of polyethylene terephthalate (PET), which is used in the manufacturing of plastic bottles, polyester fibres, and films.
  - **Substituted benzoic acids:** Various substituted benzoic acids, such as 3,5-dinitrobenzoic acid or 3-nitrobenzoic acid, can be used in specific chemical syntheses or as intermediates in organic reactions.

- **ADVANTAGE OVER ALTERNATIVES**
  - **Versatile Synthesis and Reactions**: Diphenic acid can be prepared in the laboratory from anthranilic acid via the diazonium salt. It also exhibits a wide range of reactions, making it a versatile compound in synthetic organic chemistry.
  - **Important Applications**: Compounds containing the diphenic acid moiety have important applications in various fields. This broad applicability makes diphenic acid a superior choice in many contexts.
  - **Structural Properties**: Diphenic acid is the most studied of several isomeric dicarboxylic acids of biphenyl1. Its unique structural properties, including the ability to form a variety of coordination polymers1, make it superior to alternatives.

- **MAGNITUDE OF IMPORTS IN INDIA**
    - Diphenic Acid worth $595 has been imported in India .Average import price for diphenic acid was $23.74. Diphenic Acid was imported from 3 countries. Germany was the largest exporter of diphenic acid accounting for 82.74% of the total imports of diphenic acid. Switzerland was the second largest exporter of diphenic acid accounting for 13.96% of the total imports of diphenic acid.

Economic feasibility:

INPUT RAW MATERIALS

PART A : For the Diazotization of Anthranilic Acid :

- Anthranilic acid (50 grams)
- Water (150 cc)
- Concentrated hydrochloric acid (92 cc, with a specific gravity of 1.19)
- Sodium nitrite (26.3 grams)
- Water (350 cc)

PART B : For the Preparation of the Reducing Agent :

- Hydrated cupric sulphate (126 grams)
- Water (500 cc)
- Concentrated ammonium hydroxide (210 cc, with a specific gravity of 0.90)
- Hydroxylammonium sulphate (42 grams)
- Sodium hydroxide solution (6 N, 85 cc)
- Water (120 cc)

PART C : For the Synthesis of Diphenic Acid :

- Diphenic acid (from the diazonium solution prepared in Part A)
- Concentrated hydrochloric acid (250 cc)
- Sodium bicarbonate (40 grams)
- Norite (0.1 grams)
- Cold water (50 cc)
- 6 N hydrochloric acid (excess)
- Water (200 cc)

RAW MATERIAL COST DISTRIBUTION

- ·**Anthranilic acid:** 50 grams at ₹550 per kilogram is approximately ₹27.5.

- **Concentrated hydrochloric acid:** 92 cc at ₹262 per litre (assuming 1 cc = 1 ml) is approximately ₹24.1.
- **Sodium nitrite:**26.3 grams at ₹65 per kilogram is approximately ₹1.71.
- **Hydrated cupric sulphate:**126 grams at ₹200 per kilogram is approximately ₹25.2.
- **Concentrated ammonium hydroxide:** 210 cc at ₹401 per metric ton (assuming 1 cc = 1 ml and 1 metric ton = 1000 litres) is approximately ₹0.084.
- **Sodium hydroxide solution:** 85 cc of 6 N solution at ₹18,000 per kilogram (assuming 1 cc = 1 ml and 1 N solution has approximately 40 g of NaOH per litre) is approximately ₹51.
- **Sodium bicarbonate:** 40 grams at ₹26 per kilogram is approximately ₹1.04.

Adding all these up,the total estimated cost for the quantities is approximately ₹130.63.

PRODUCT SELLING PRICE: 6000 Rupees per kilogram

PRODUCT COST PRICE: 3714.28 Rupees per kilogram.

PROFIT = SELLING PRICE – COST PRICE

= 6000-3714.28 = 2285.71 Rupees per kilogram.

References:

- https://en.wikipedia.org/wiki/Diphenic_acid
- https://www.zauba.com/import-diphenic+acid-hs-code.html
- https://www.indiamart.com/proddetail/diphenic-acid-25859979930.html
- https://www.chemicalbook.com/price-india/Diphenic-acid.htm
- https://dir.indiamart.com

List the contributions of each author:

- Author 1 (Bhavishya Gupta)carried out the market research for chemical trade data. and prepared the use case.
- Author 2 (Harshit Gupta) looked at economic feasibility.

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