

Company: Chimique Inc

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Chemical Formula: $C_7H_8ClN_3O_4S_2$

Chemical Name: 6-Chloro-3,4-dihydro-2H-1,2,4-benzothiadiazine-7-sulfonamide 1,1-dioxide (Hydrochlorothiazide)

Use case:

a. What is the use of this compound?

Hydrochlorothiazide belongs to a class of drugs known as diuretics (water pills). It works by causing you to make more urine. This helps your body get rid of extra salt and water. This medication also reduces extra fluid in the body (edema) caused by conditions such as heart failure, liver disease, or kidney disease.

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

Yes, There are some alternatives to Hydrochlorothiazide such as Lisinopril, Amlodipine, Enalapril, Benazepril, Losartan, Valsartan and furosemide.

c. Why this compound is superior to its alternatives?

Hydrochlorothiazide is often preferred due to its effectiveness in treating hypertension, edema, and heart failure, especially when used in combination with other medications. It has a well-established safety profile, is cost-effective, and has a low risk of significant side effects compared to alternatives like Lisinopril, Amlodipine, Enalapril, Benazepril, Losartan, Valsartan, and Furosemide.

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

Hydrochlorothiazide manufactured in India itself, in spite India is one of the largest exporter of HCTZ in world. As per Volza's India Export data, Hydrochlorothiazide export shipments from India stood at 33.7K, exported by 855 India Exporters to 4,025 Buyers. India exports most of its Hydrochlorothiazide to United States, Singapore and Kenya and is the largest exporter of Hydrochlorothiazide in the World. The top 3

exporters of Hydrochlorothiazide are India with 33,694 shipments followed by United States with 1,181 and China at the 3rd spot with 960 shipment

Economic feasibility:

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

1. 5-chloro-2,4-sulfonyl-aniline (II)
2. Formaldehyde
3. Alkali metal hydroxide
4. Solvent (from THF, dioxane, di-ethylene glycol, methanol and water or mixture)
5. liq. Ammonia
6. Sodium hydroxide
7. Activated carbon.
8. Diethylene glycol
9. Diethyl ether

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

| Serial Number | Compound | Price in respective values | Amount to be use | Cost of Raw material in Rs |
|---------------|--------------------------------------|----------------------------|------------------|----------------------------|
| 1. | 5-chloro-2,4-disulfonyl-aniline (II) | Rs 950/Kg | 1.25 Kg | Rs 1187.50 |
| 2. | Paraformaldehyde | Rs 85/Kg | 149 grams | Rs 12.665 |
| 3. | Liquid Ammonia | Rs 20/litre | 6.25 Litre | Rs 125.00 |
| 4. | 50% NaOH solution | Rs 55/litre | 2.50 Litre | Rs 137.5 |
| 5. | Activated carbon | Rs 170/Kg | 25 grams | Rs 4.25 |
| 6. | 5N HCl | Rs 12201/ 5 Litre | 7 litre | Rs 17081.4 |

Market Analysis Report

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|--|--|--|--------------|--------------|
| | | | TOTAL | Rs 18,548.32 |
|--|--|--|--------------|--------------|

Approximately Price of Raw material for 1Kg HCTZ = Rs 18,550

As per data Retail price of HCTZ per Kg = Rs 36,000

Profit = Retail price - Raw material price

Profit = Rs 17,450/Kg

Profit per gram = Rs 17.45

References:

<https://www.webmd.com/drugs/2/drug-5310/hydrochlorothiazide-oral/details>

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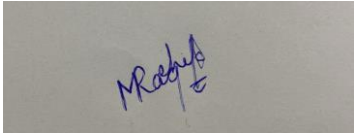
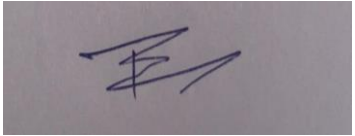
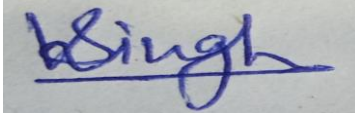
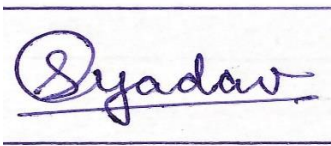
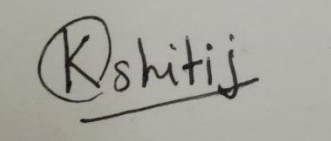
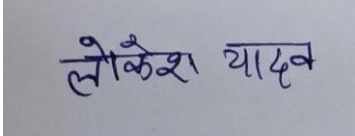
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<https://www.volza.com/p/hydrochlorothiazide/export/export-from-india/>

List the contributions of each author:

- Vyom and Ram carried out the market research for chemical trade data
- Kshitiz and Lokesh prepared the use case.
- Samarth looked at economic feasibility.

Market Analysis Report

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