

Company: BCG

CEO: Abhinaba Mukherjee

Report Authors: Sourav Sharma (211055), Vishal

Chemical Formula: C₁₄H₁₄O₃

Chemical Name: (S)-6-Methoxy- α -methyl-2-naphthaleneacetic acid

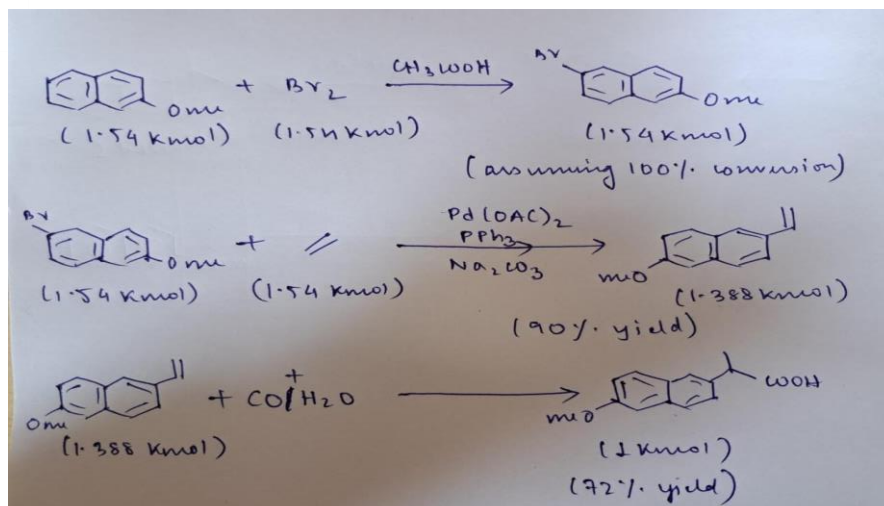
Use case:

- a. What is the use of this compound?
Naproxen is a nonsteroidal anti-inflammatory drug (NSAID) used to treat pain, inflammation, and stiffness caused by arthritis, menstrual cramps, and gout. It is also used to reduce fever. Naproxen works by preventing the body from producing certain natural substances that cause pain and inflammation.
- b. Are there any alternatives to this compound? Name a few.
Yes, there are some alternatives, such as aspirin, ibuprofen, acetaminophen, and diclofenac.
- c. Why this compound is superior to its alternatives?
Some studies have suggested that when compared to other NSAIDs such as diclofenac or ibuprofen, Naproxen may have a lower risk of certain adverse effects such as gastrointestinal bleeding and cardiovascular events.
- d. Is this compound imported in India? What is the magnitude of imports?
Yes

Economic feasibility:

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

Methoxy Naphthylene
Palladium(II) acetate
Triphenylphosphine
Sodium carbonate/NEt₃
Br₂/CH₃COOH
Ethylene
N-alkyl Glucamine(work as chiral auxiliary)
Dioxan
- b. Provide preliminary economic feasibility based on cost of raw materials, solvents and product selling price.



Compound	Rate(in Rs/kg)	Rate(in Rs/Kmol)	Quantity(in Kmol)	Amount(in Rs)
Methoxy Naphthylene	7,400	11,70,680	1.54	18,02,847.20
Palladium(II) acetate	1,40,00,000	----	Catalyst	Catalyst
Triphenylphosphine	7,200	18,88,560	Catalyst	Catalyst
Sodium carbonate	40	4,240	Catalyst	Catalyst
CH3COOH	50	3,000	Solvent	Solvent
Ethylene	75	2,100	1.54	3,234
Dioxane	1,263	1,11,153	Solvent	Solvent
Bromine gas	300	47,700	0.77	36,729
Naproxene	29,600	68,08,000	1	68,08,000

Total input costs of raw materials for producing 1 kmol Naproxene

= Rs (11,70,680+2,100+47,700)=Rs 12,20,480

Assuming that for producing 1 kmol Naproxene 0.01 kmol of triphenylphosphine and sodium carbonate and 0.1 kmol of acetic acid and dioxane to be used as balance input .

Total input cost for the solvents and catalyst

=Rs (0.01(7200+40) +0.1(1,11,153+3,000)) = Rs 11,487.7

NET PROFIT IN PRODUCING 1 kmol NAPROXENE

=Rs(68,08,000-11,487.7-12,20,480)

=Rs 55,76,032

References:

<https://www.srlchem.com/products/product/productId/142958/Palladium-II-Acetate-3375-31-3>

https://srlchem.com/products/product_details/productId/1253/Triphenylphosphine-pure--98--603-35-0

<https://dir.indiamart.com/impcat/soda-ash.html>

<https://dir.indiamart.com/impcat/acetic-acid.html>

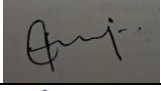

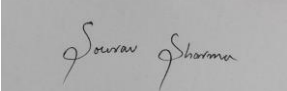
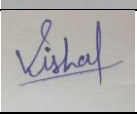

<https://www.indiamart.com/proddetail/liquid-ethylene-19048817691.html>

<https://www.ottokemi.com/ir-spectroscopy-solvents/14-dioxan-spectroscopy.aspx>

List the contributions of each author:

- Akshat Jain and Sourav Sharma carried out the market research for chemical trade data.
- Vishal Vyavhare prepared the use case.
- Shivansh Maheshwari looked at economic feasibility.

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Name	Roll No	Signature
CEO Name	210028	
Akshat Jain	210090	
Sourav Sharma	211055	
Vishal Vyavhare	211174	
Shivansh maheswari	210987	
Fifth author Name, Roll No & signature (if any)		
Sixth author Name (if any)		