

Continuous flow synthesis of sulphoxide compounds for use in drug formulations

EXECUTIVE SUMMARY

A process for continuous flow synthesis of pharmaceutically important sulphoxide compounds (used as Proton Pump Inhibitors- used in treating gastric disorders) with very less reaction time and easy scalability

BACKGROUND

Sulphoxide compounds such as prazoles and modafinils are currently produced using batch synthesis procedure which has longer processing times (1-4 hours). A more efficient process is required at industrial levels.

TECHNOLOGY DESCRIPTION

NCL scientists have developed a process of continuous flow synthesis of sulphoxide compounds with reaction times of ≤ 1 minute. The reaction results in over 90% conversion and over 95% selectivity towards the target sulphoxide compounds (with less than 5% formation of undesired sulphone compounds)

MARKET POTENTIAL

- GI disorders have been projected to affect more than a 250 million people in the 7 large pharma markets by 2012¹
- Overall GI tract disorders treatment market is expected to reach \$32.2 billion by 2014²
- In 2009, proton pump inhibitors were the third largest therapeutic class amounting up to \$13.6 billion of sales in the US³

¹www.astrazenecaannualreports.com/documents/2010/therapy_review_area_factsheets/gastrointestinal.pdf

²www.prnewswire.com/news-releases/reportlinker-adds-gastrointestinal-pharmaceuticals-technologies-and-markets-68849697.html

³www.imshealth.com

VALUE/ADVANTAGES

- Process capable of easy scale up
- Results in high yield of the product with 95% of selectivity towards the sulphoxide compounds
- Conversion rate is $> 90\%$
- The process provides an alternative solvent (to chloroform, which is a volatile solvent that evaporates at room temperature and changes the reaction mass)

APPLICATIONS

- The process can be used to make prazoles- used to make drugs to treat the acid-related diseases of the gastrointestinal (GI) tract
- The process can also be used to make drug molecules that can be used as modafinil compounds used as central nervous system stimulants- wakefulness promoting agents
- In production of drugs which act as neuroprotective agents

TECHNOLOGY STATUS

- Demonstrated at the lab scale
- On the lookout for potential partners for licensing
- Patent application filed: Indian #- 1392/DEL/2009 & PCT- [IN2010/000456](https://pubchem.ncbi.nlm.nih.gov/patent/IN2010/000456)

