NON TECHNICAL NOTE

Process on Electrochemical preparation of p-methoxy benzaldehyde

1. Name of the process : Electrochemical preparation of p-methoxy benzaldehyde

2. Products : p-methoxy benzaldehyde

3. Uses of the products :

Aromatic aldehydes are important intermediates used in the production of fine chemicals and pharmaceuticals. They are generally produced from the corresponding aromatics by methods such as chlorination, Gattermann, s synthesis, Fridley - Craft reaction etc. Recently there has been renewed interest in the development of eco-friendly electrochemical processes for the synthesis of aldehydes.

4. Advantages :

More economic method than other conventional methods involving inorganic oxidizing agents because the oxidant can be regenerated and used as excellent selectivity and avoids effluent problems.

a. The formation of p-methoxy benzaldehyde is in higher yield in comparison with chemical methods.
b. The conversion of the p- methoxy toluene is high.
c. There is no bye-product formation in comparison with chemical methods.
d. No spent reagent disposal. Hence this process is eco-friendly.

5. a. Present consumption pattern : 5000 TPA
b How is the demand being met : by import
c. Estimated future demand : expected to increase
d. Present market price : Rs.160.00 per kg

6. Description of the process:

p-methoxy benzaldehyde is prepared in good yield using electrochemically generated cerium(IV)methanesulphonate in an undivided electrochemical cell. This Ce(III)/Ce(IV)redox system was extended to prepare p-methoxy benzaldehyde in a batch chemical reactor at a temperature of 30^0C with vigorous stirring to obtain a solution and recovering the p-methoxy benzaldehyde by extraction with an organic solvent 1,2 dichloromethane. The main advantage of the process is that the oxidant Cerium (IV) methanesulphonate can be regenerated in good current efficiency and hence the process is very economical.

7. Process flow sheet : Annexure – I
8. Purity of the product : 98.6 %
9. Laboratory work details :
   a. Scale of investigation : 100 grams per batch
   b. Can you supply samples : yes
   c. Quantity of product prepared : 100 grams per batch

10. a) Total Capital Investment :

a.	Total Capital Investment	: Rs.81.00 lakhs
b.	Fixed capital investment	: Rs.40.00 lakhs
c.	Working capital investment	: Rs.31.00 lakhs
d.	Cost of production	: Rs. 141.00 per kg
e.	Selling price	: Rs. 160.00 per kg
f.	Annual Turnover	: Rs. 160 lakhs
g.	Gross profit	: Rs.19.00 lakhs
h.	Net profit	: Rs. 18.00 lakhs
i.	Return on investment	: 22%

b) Suggested terms of release of the process:

1. Lump sum premium Rs.5.0 lakhs
2. Recurring royalty - 3% on sales.

12. Address for correspondence :

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