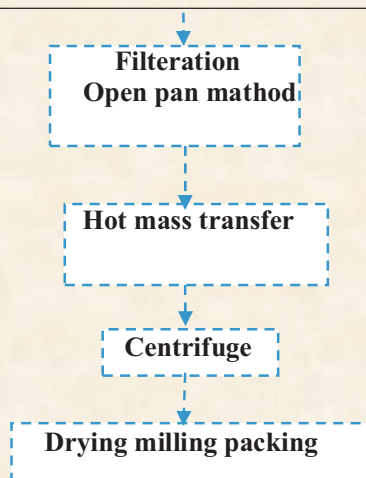


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|--|---|
| Intervening Technology/Technique | Modification in the Manufacturing Process of Hydroxy Sulfo Propyl Pyridinium Betaine. |
| About the industry | M/s. Parth Chem & Technologies is a major Manufacturer, Exporter and Supplier of Electroplating Intermediates & Pharmaceuticals Intermediates located at Vatva, Ahmedabad in Gujarat. Company engaged in manufacturing of Hydroxy Sulfo Propyl Pyridinium Betaine, Sodium Propyne Sulfonate, , Sodium Allyl Sulfonate etc. |
| Implemented Techniques/Technology | <p>Before</p> <p>Hydroxy Sulfo Propyl Pyridinium Betaine Water, Pyridine and 3-Chloro-2-Hydroxypropane Sulphonic Acid are taken into Reaction Vessel. During stirring, it is slowly heated. Keep this stage for 14 hrs to reach the temperature 100°C - 105°C to complete the reaction. Than cool it to the room temperature, treat with carbon and filter. Clear filtrate was evaporated in open pan at 105^oC - 130^o C by steam heating in jacket to get pasty mass; it will take minimum 25 hrs time. Followed by cooling, centrifuging, drying, milling and packing.</p> <div style="text-align: center;"> $2 \left[\text{NaSO}_3\text{CH}_2 - \overset{\text{OH}}{\underset{ }{\text{CH}}} - \text{CH}_2 - \text{Cl} \right] + \text{Pyridine}$ <p>2-Hydroxy 3-Chloropropane Sulphonic Acid Sodium Salt Pyridine</p> <p style="text-align: center;">OH + NaCl Sodium Chloride CH₂--- CH-CH₂SO₃ Hydroxy Sulphopropyl Pyridinium Betaine</p> </div> <p style="text-align: center;">Before C.P.</p> <div style="text-align: center;"> <div style="border: 1px dashed blue; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">Mixing Solid Raw Material Charged Liquid Raw Material charged</p> </div> <p style="text-align: center;">↓</p> <div style="border: 1px dashed blue; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">Reaction In normal condition</p> </div> <p style="text-align: center;">↓</p> </div> |

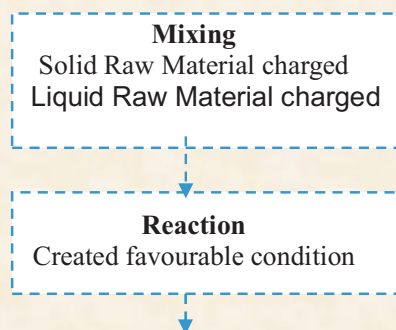




After

- Required quantity of Water and Sodium 3-Chloro-2- Hydroxypropane Sulphonic Acid are taken in to Reaction vessel. Pyridine is charge during stirring (10 % extra in first batch) by vacuum. Reaction mass is then heated at lower temperature of 70°C - 100 °C maximum.
- In this process the reaction completes within 6 hrs instead of 14 hrs at 102°C - 105 °C. The content is cooled to room temperature and filtered through sparkler filter pump in closed system. The clear filtrate is taken in to vacuum evaporator by gravity under low pressure.
- In this process heating is done externally by steam and distillate about 812 kg. Than it is collecting at 60°C -100°C temperature under vacuum pressure of 650-690 mm within 10-12 hrs instead of 25 hrs at 105°C-130°C. 812 kg of distillate is successively reused for next batch. The hot residue from the closed evaporator is taken out by Gravity in to trays, followed by cooling, centrifuging, drying, milling and packing. There is reduction in time cycle, energy, water consumption and new method is in environmental friendly manner.

After C.P.



| | | |
|-------------------|--|--|
| | <div style="border: 1px dashed blue; padding: 5px; margin-bottom: 5px;"> Evaporation Closed under Vacuum & Condensation </div> <div style="text-align: center;">↓</div> <div style="border: 1px dashed blue; padding: 5px; margin-bottom: 5px;"> Hot mass transfer Gravity under stirring </div> <div style="text-align: center;">↓</div> <div style="border: 1px dashed blue; padding: 5px; margin-bottom: 5px;"> Centrifuge </div> <div style="text-align: center;">↓</div> <div style="border: 1px dashed blue; padding: 5px;"> Drying milling packing </div> | |
| Benefits | Before CP | After CP |
| <i>Economical</i> | Water and Energy consumption was more. | Water Saving : 812 kg per tonne of Product Electricity Saving : 206 kW per tonne of product |

