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## 1. INTRODUCTION

- Water consumption is soaring, and therefore water recycling had its stake in this packing world[1,2]. Agricultural sector and production industry the most in need of water. Safe and clean water is the part to run after as it is becoming scarce.
- The very promising option is reusing of this very effluent water seems to be inevitable done thing.
- Boron being as microelements it seems to pose a threat to the Environment, toxicity. But it can be used for other purposes once got recovered from, for example, for the glass producing industries, it will clear a gap emerging due to increasing demands of using Boron as a part of raw materials [2,4].
- Reliable and economical methods to mitigate this very problem must get developed to counterbalance the demands and availability, combating the environmental problems which are down to pollution we have been creating [3].

## 2. RESEARCH AIMS AND OBJECTIVES

To Recover Borate from Hydrochloric acid containing by-product effluent stream using Simulated Moving Bed (SMB) Chromatography.

The followings objectives will be undertaken to achieve the aim as shortlisted:

- To perform Experimental Testing to screen out the very effective and efficient resin to use it for the SMB pilot plant.
- To determine the effective recovery method to separate boron from the aqueous effluent stream containing HCl.
- To scale up the separation and recovery of boron from the effluent stream, Column Experiment to SMB chromatography.

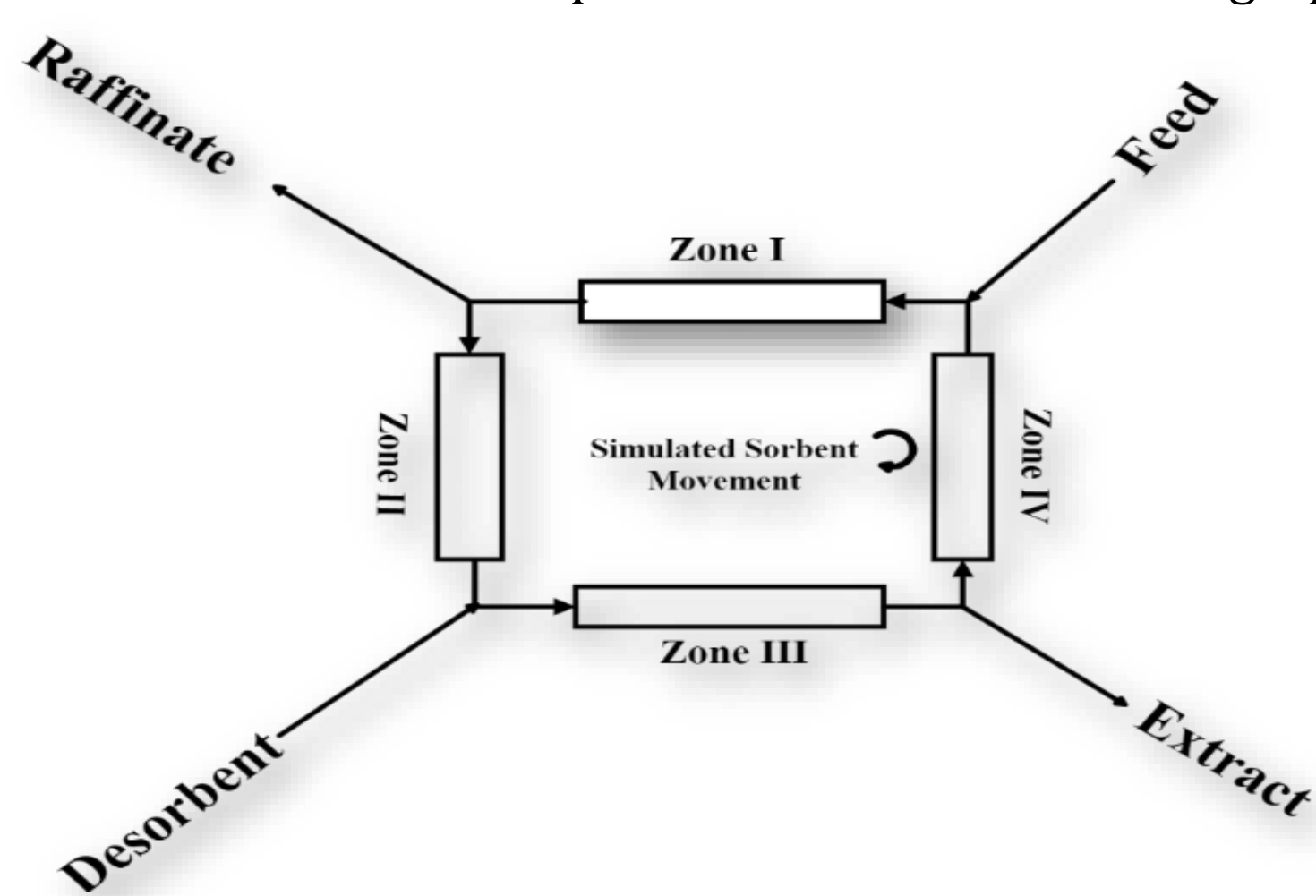


Fig 1. Simulated Moving Bed (SMB) chromatography

## 3. METHODOLOGY AND MATERIALS

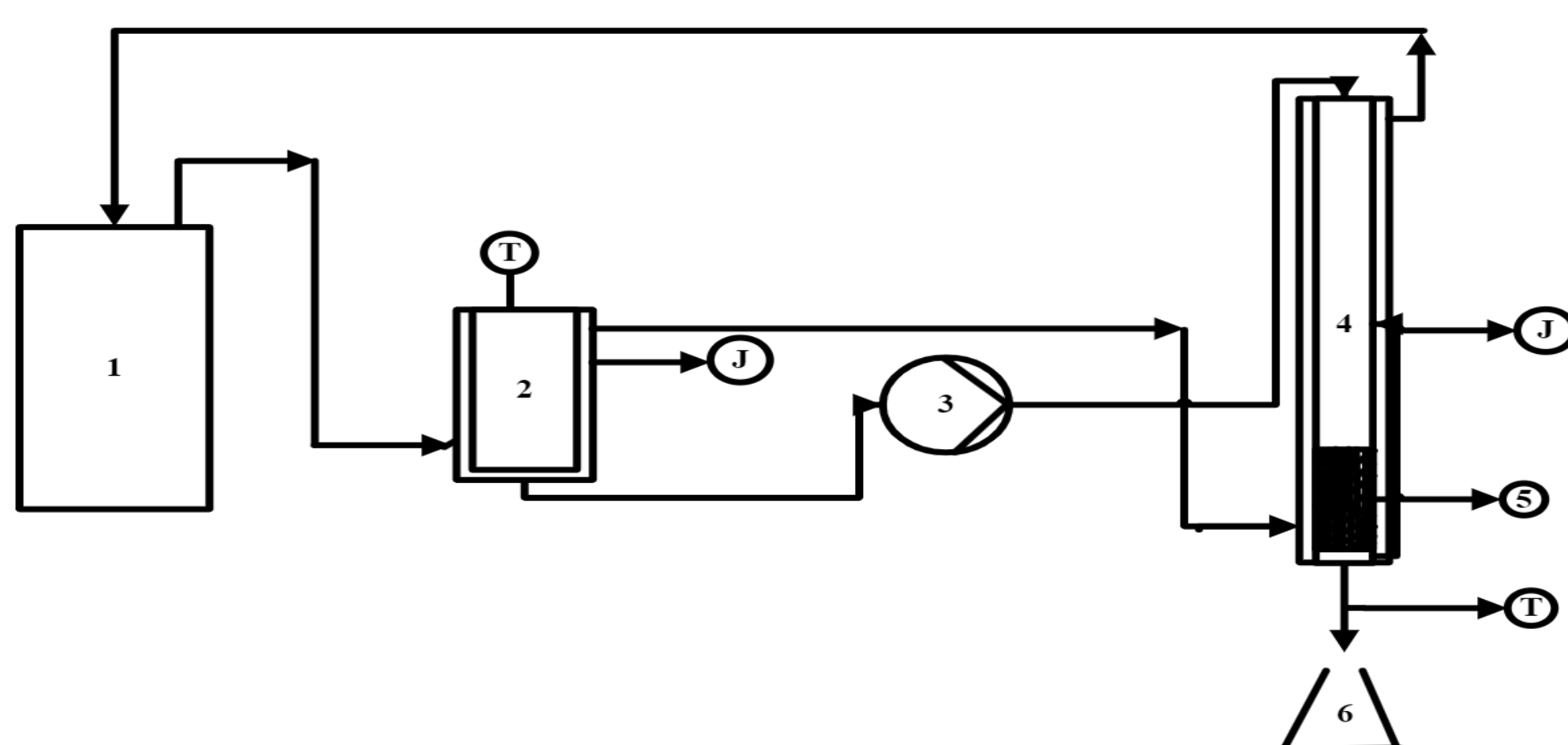


Fig 2. Column Experiment loaded with separating resins

## 5. RESULTS AND DISCUSSIONS

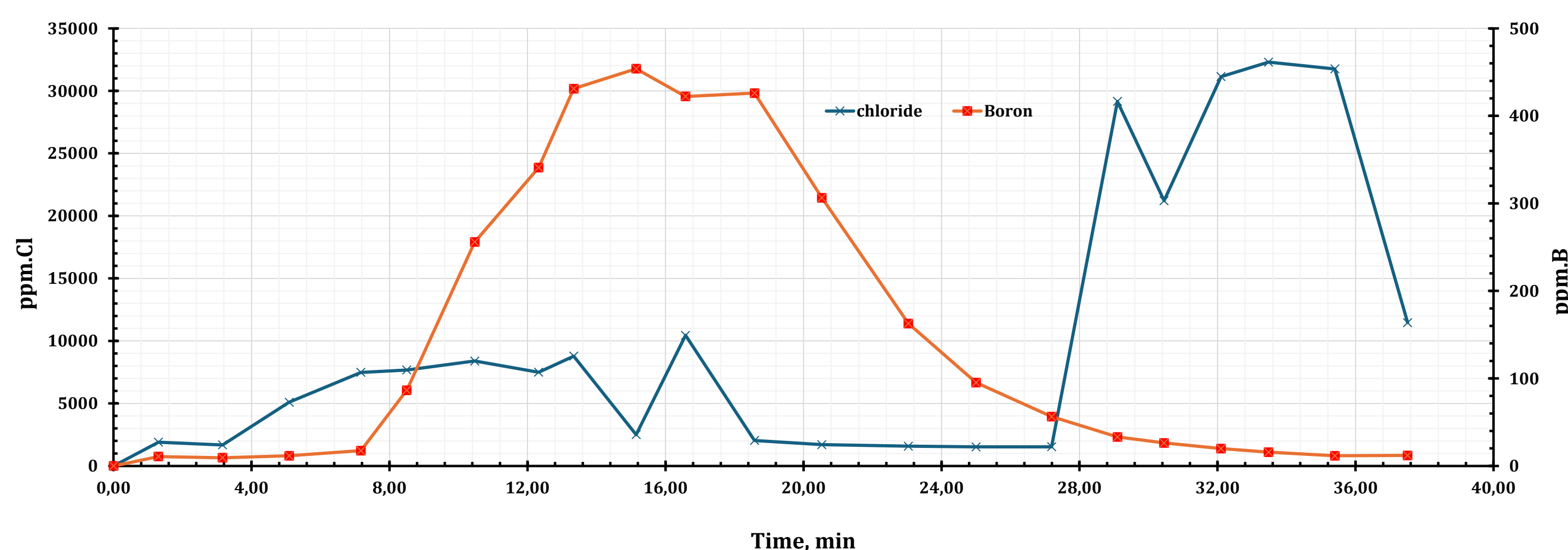


Fig 3. Borate separation from chloride using ion exchange resin (Column Experiment).

## 5. CONCLUSION

- Concept developed has been introduced to develop and conceptualize the separation technique that is effectively separator.
- Ion exclusion chromatography concepts testing is still going on and it had shown a likely agreeable degree of separating.
- Resin optimization using this very concepts at different operating conditions had shown to being effective at acidic pH condition.

## 6. FUTURE WORKS

- Resin testing and optimization.
- System optimization and Separation Process scaling up.
- Pilot plat Simulated moving Bed (SMB) chromatography commissioning and separation running and system optimization.

## 7. REFERENCES

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