

## Kinetic study of Diclofenac removal on Biocomposite microcapsules in aqueous systems

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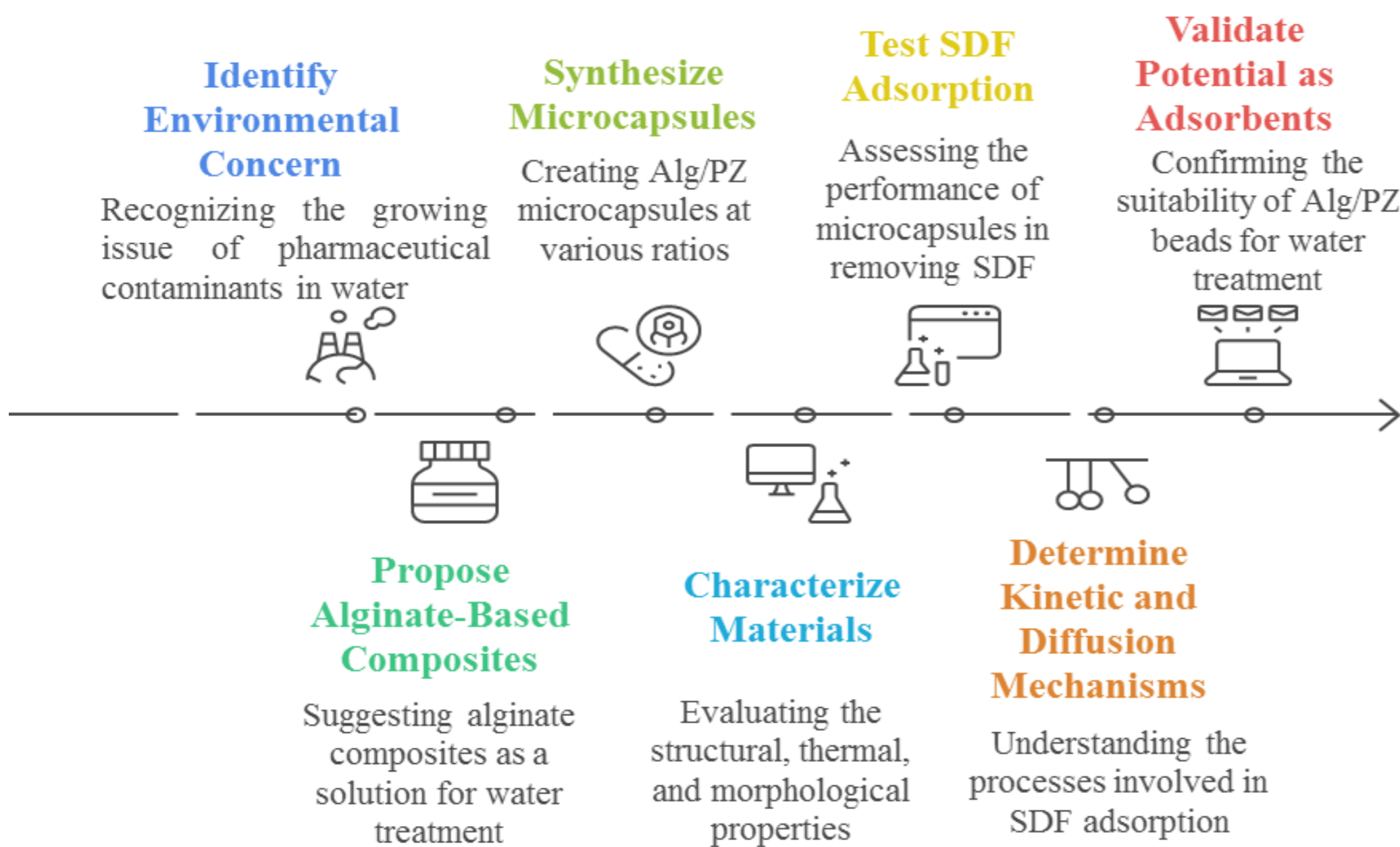
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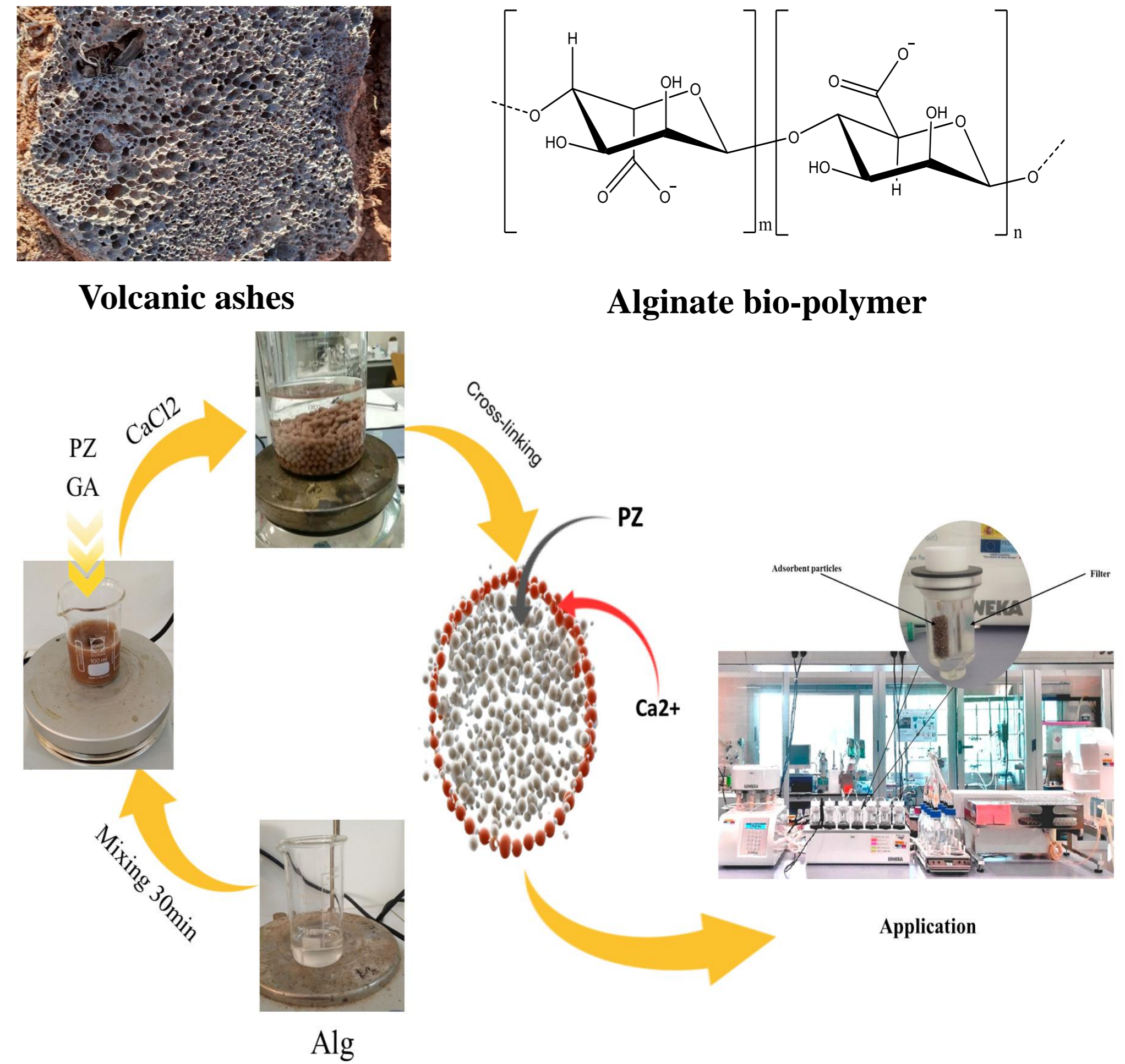
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### INTRODUCTION & AIM

Sodium-Diclofenac pharmaceutical contaminants are emerging as a formidable threat to the environment due to their persistence and toxicity in water bodies. The development of efficient, less expensive, and environment-friendly adsorbents has thus gained prominence. Alginate matrix composites incorporating inorganic fillers provide an attractive option owing to their biocompatibility and efficiency of adsorption.

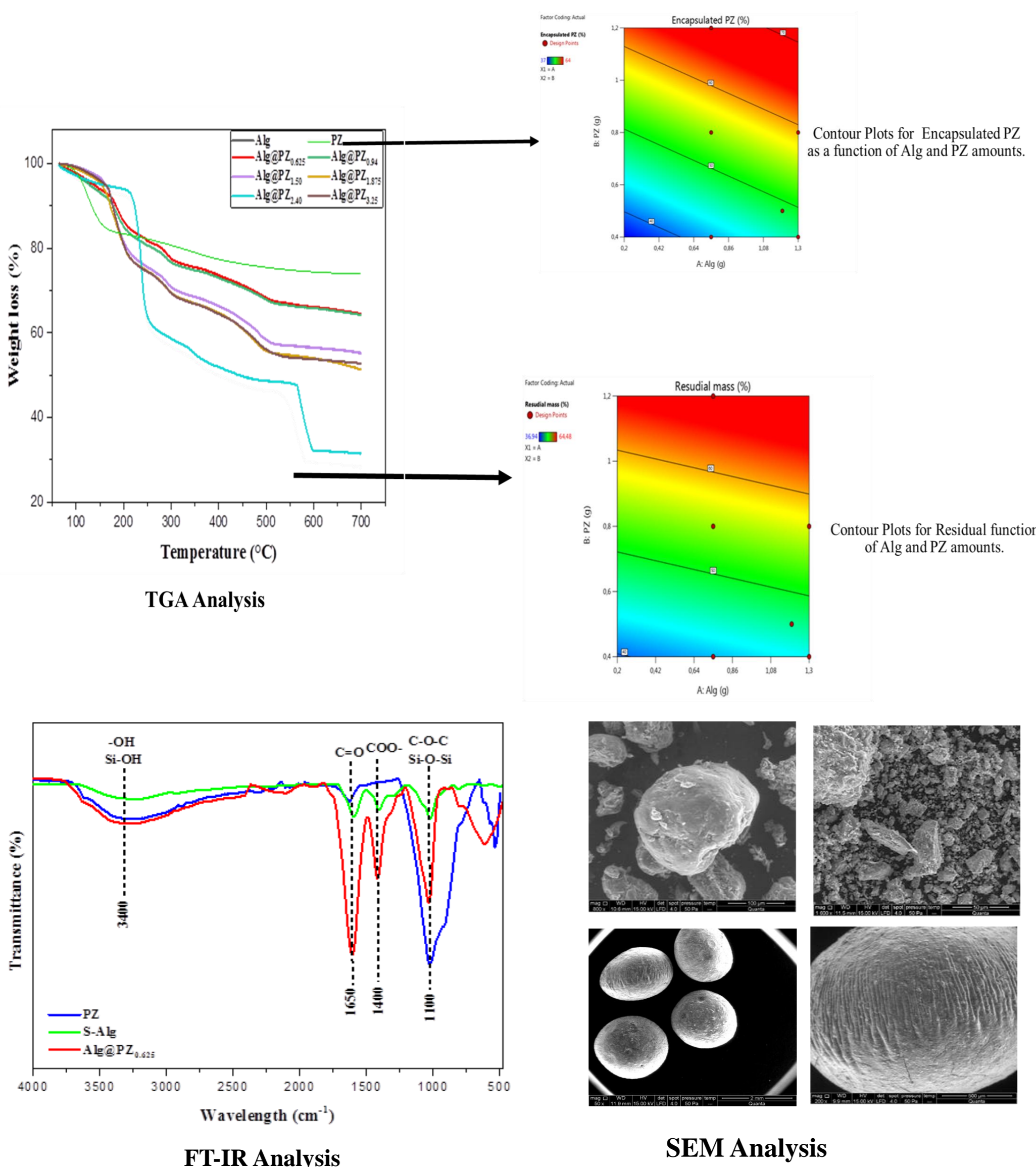


### METHOD

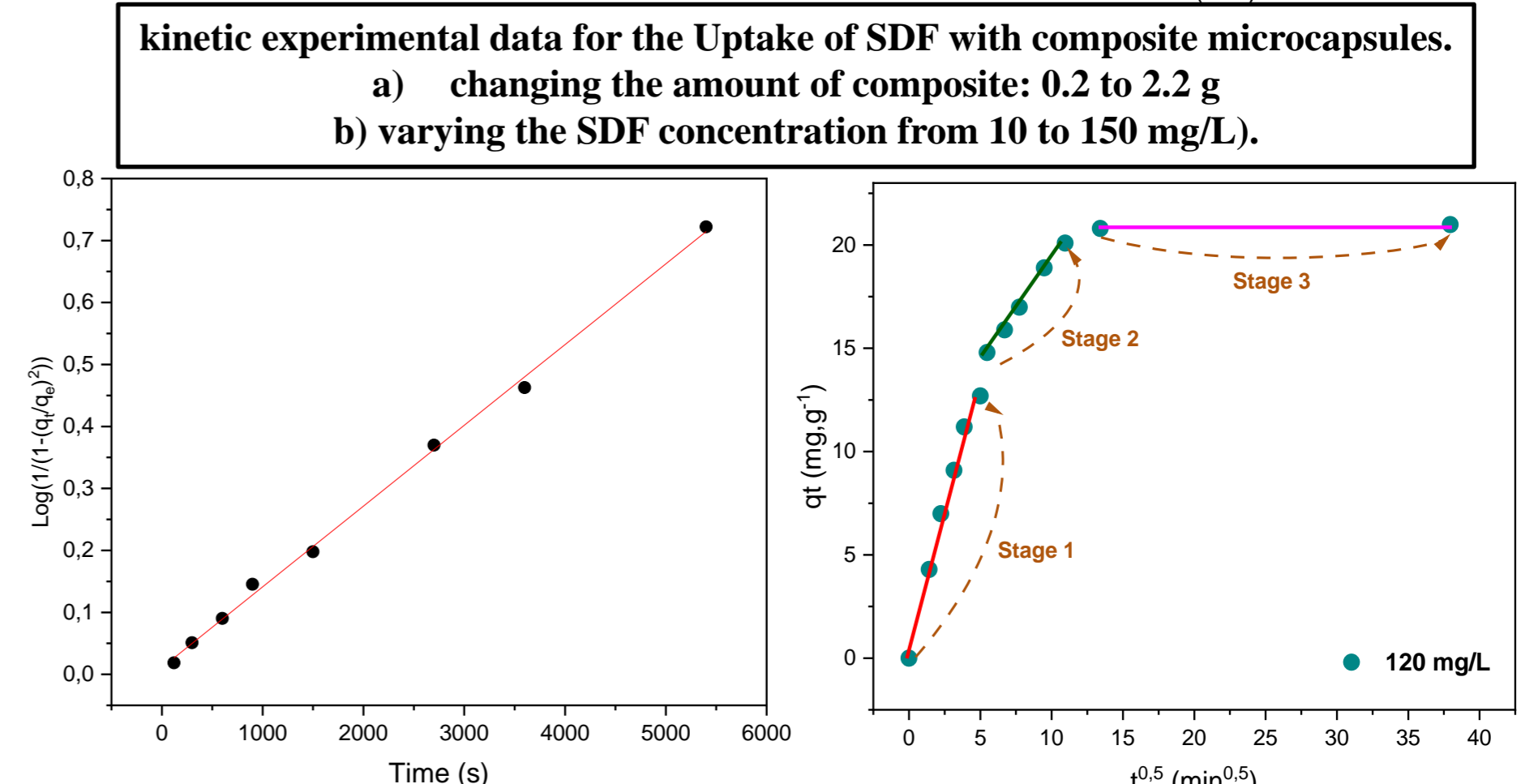
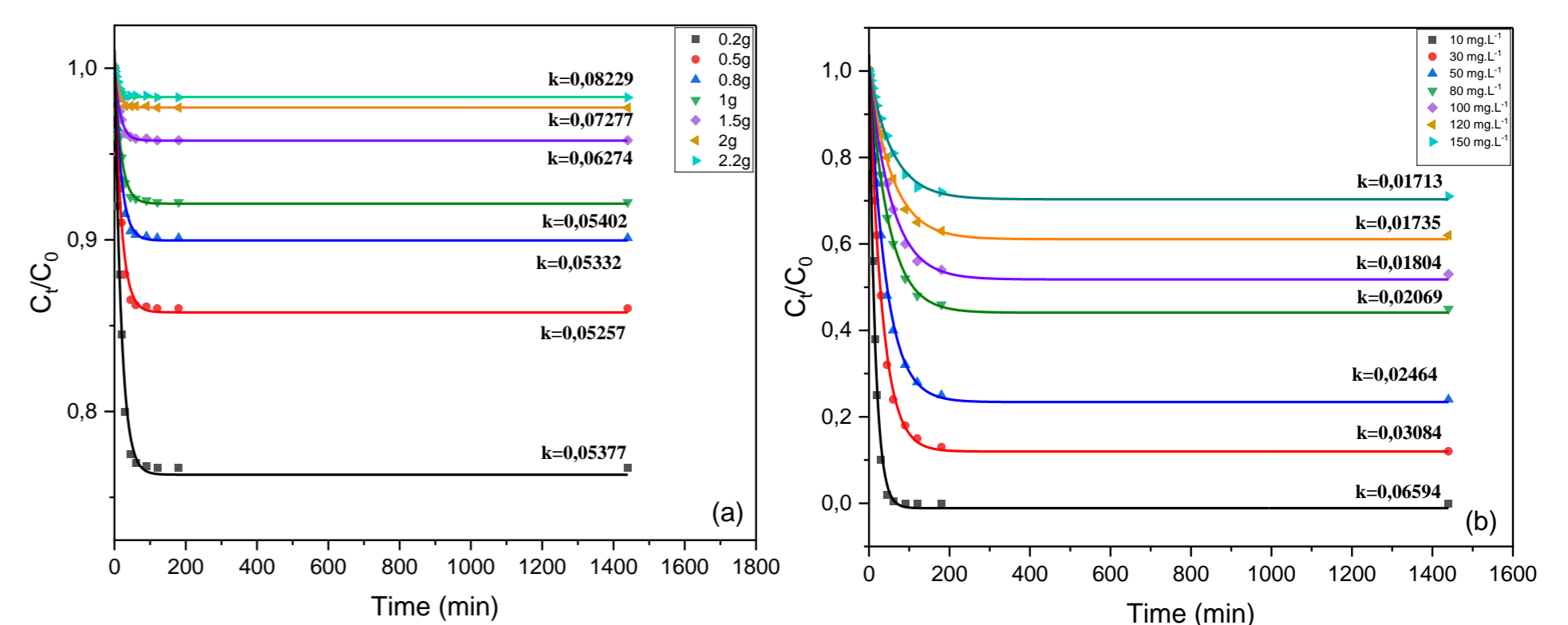


### RESULTS & DISCUSSION

#### Analysis Results



#### Application Results



### CONCLUSION

- A rapid adsorption was observed, consistent with pseudo-second-order kinetics.
- Equilibrium reached in 45 min., max = 21 mg·g<sup>-1</sup>. 98% SDF removal under optimal conditions.
- Intraparticle diffusion-controlled kinetics ( $D_{eff} = 2.96 \times 10^{-7} \text{ cm}^2 \cdot \text{s}^{-1}$ ).
- Alg/PZ = efficient, sustainable, and scalable adsorbent.