

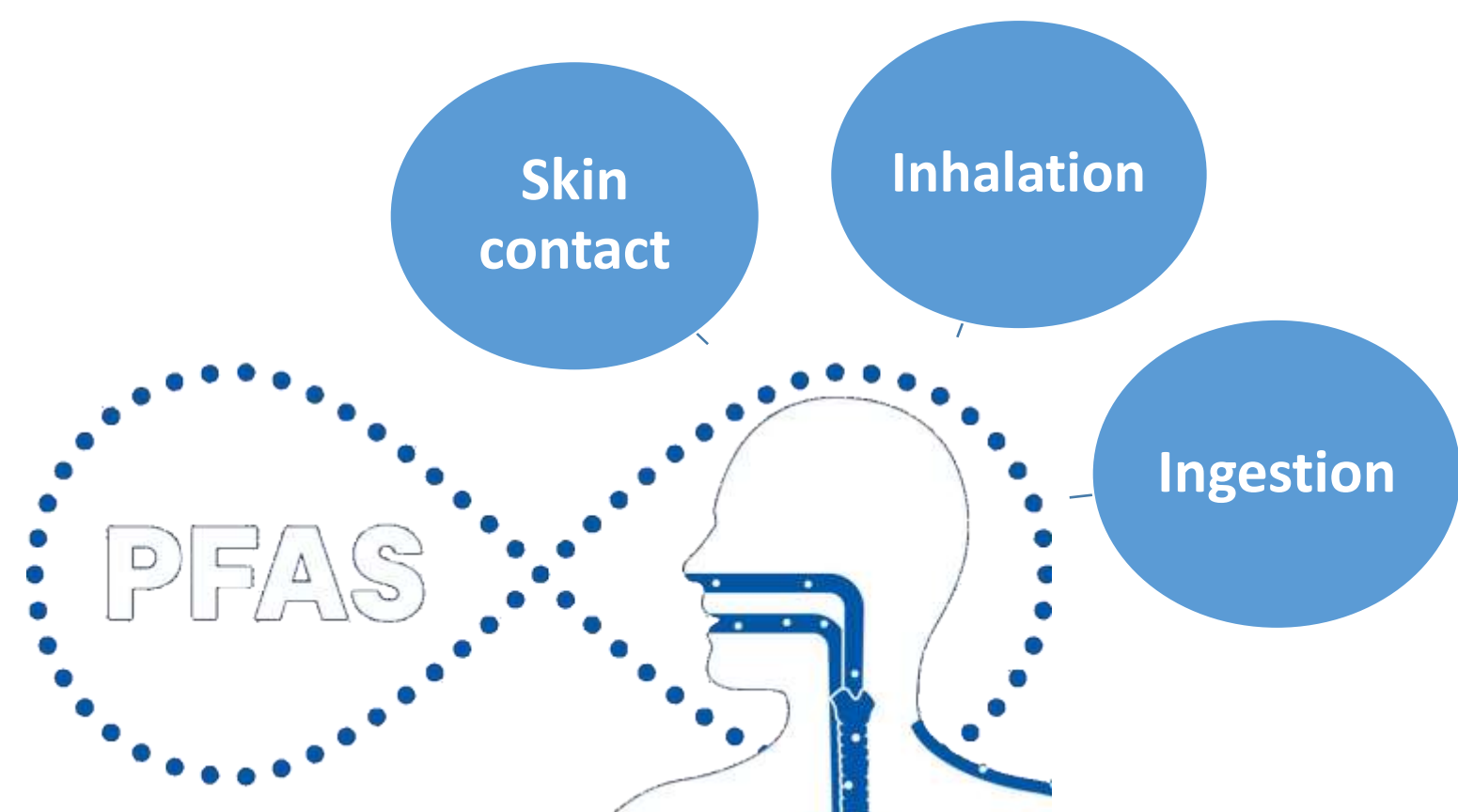
An ultrasensitive Molecularly Imprinted Polymer (MIP) sensor for the facile and rapid detection of Perfluorooctanoic acid (PFOA) in water

Objective

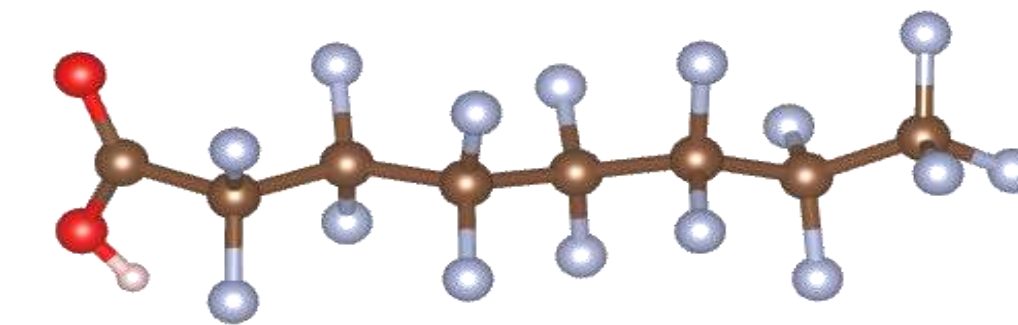
To develop MIP enabled chemo-recognition for ultrasensitive and selective electrical impedance spectroscopy (EIS) detection of per- and poly-fluoroalkyl substances (PFAS) in water

Introduction

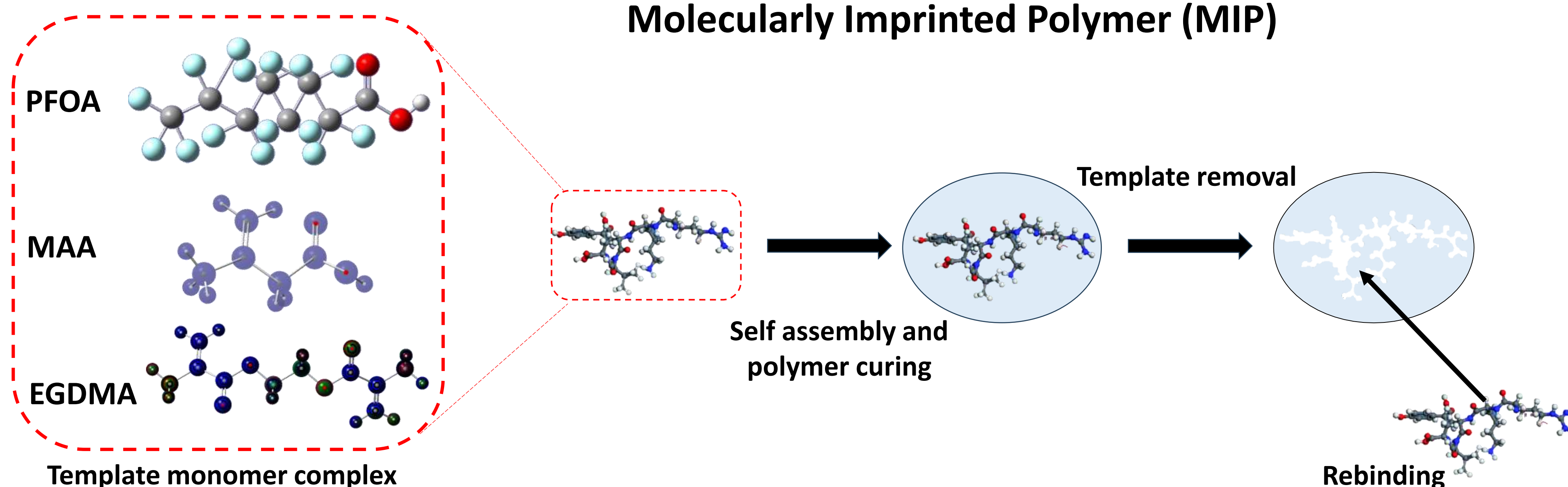
PFAS are complex group of synthetic chemicals that have been used extensively since 1950s. They are ingredients in various everyday products like sanitation supplies, non-stick protective coatings, stain repellents, fire fighting foams. They are often referred as 'Forever chemicals' due to their non-degradable C-F bonds^{1,2}.



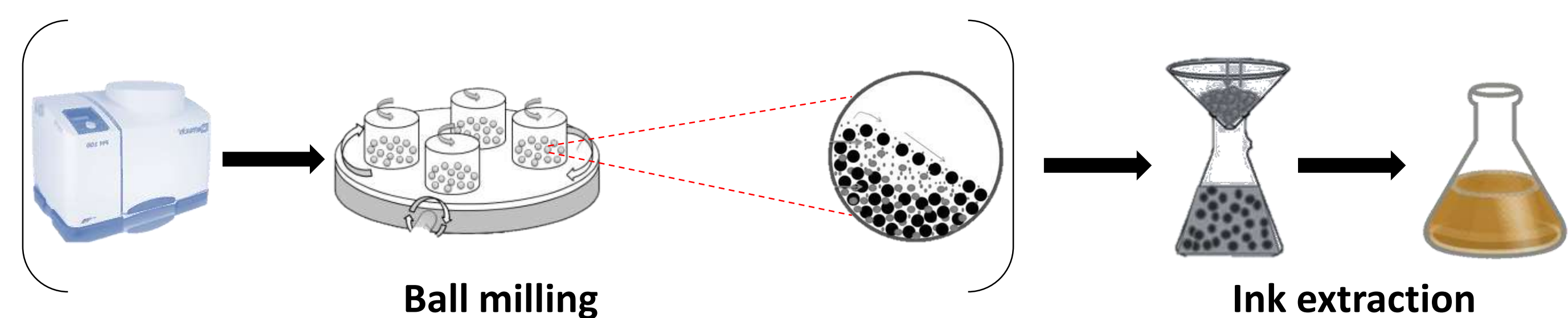
Target molecule: Perfluorooctanoic acid (PFOA)



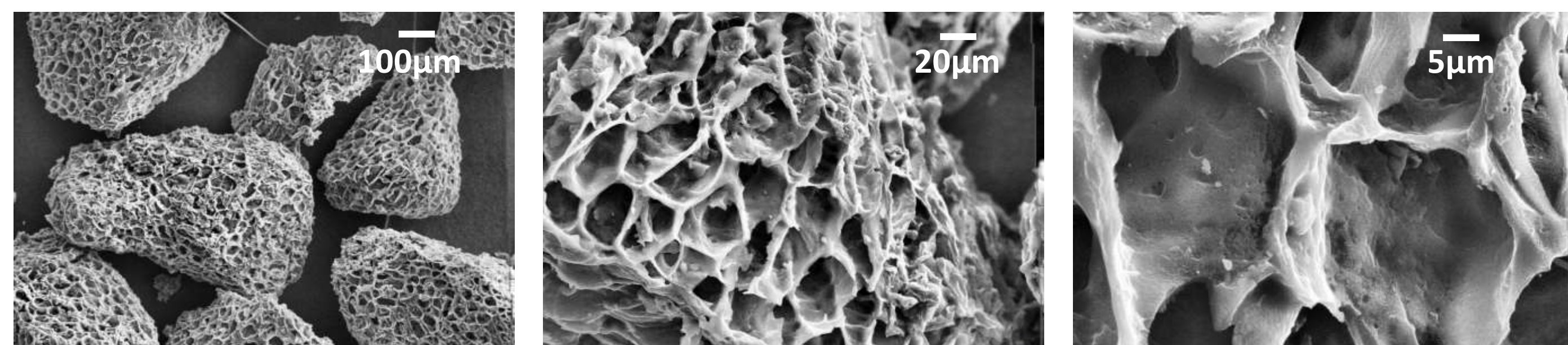
Molecularly Imprinted Polymer (MIP)



Preparation of ink for printing

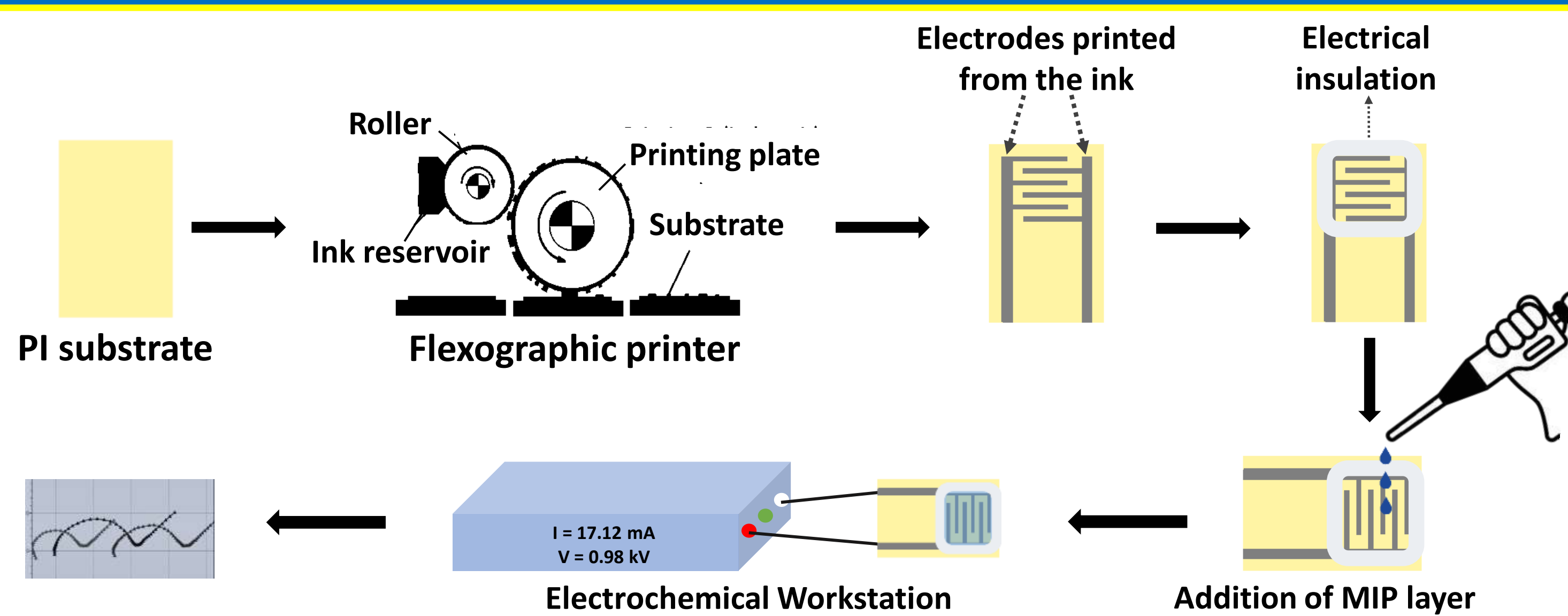


SEM images of ink

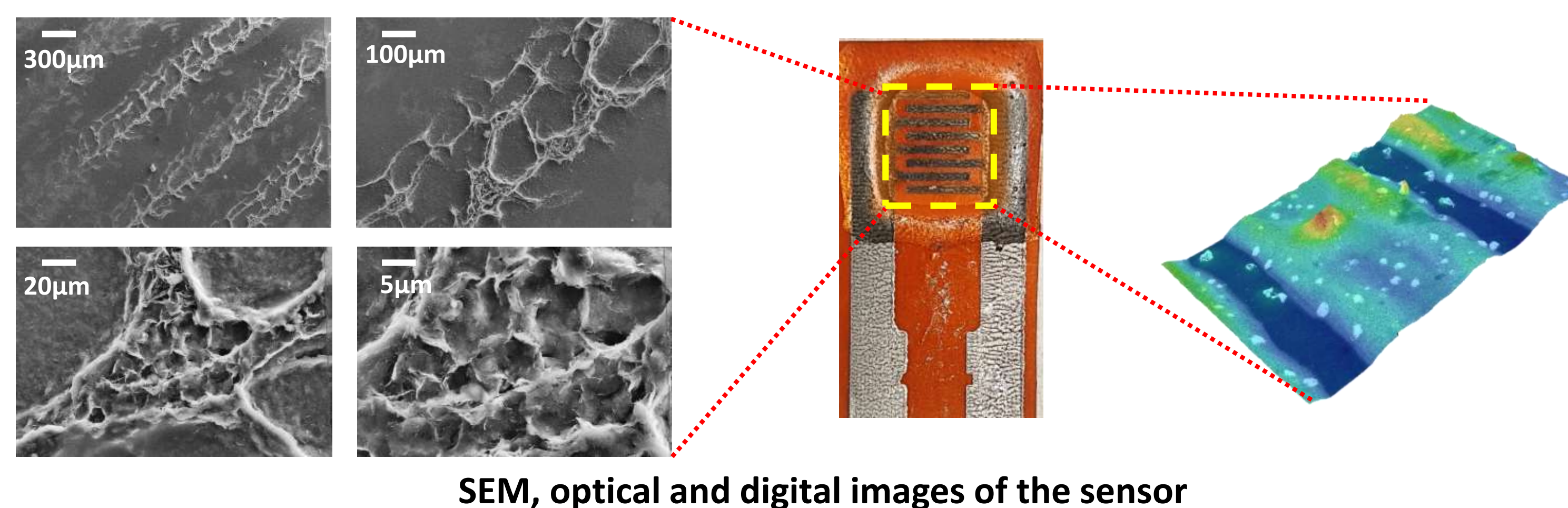


Highly porous structure of the ink aids in efficient binding of the target molecules

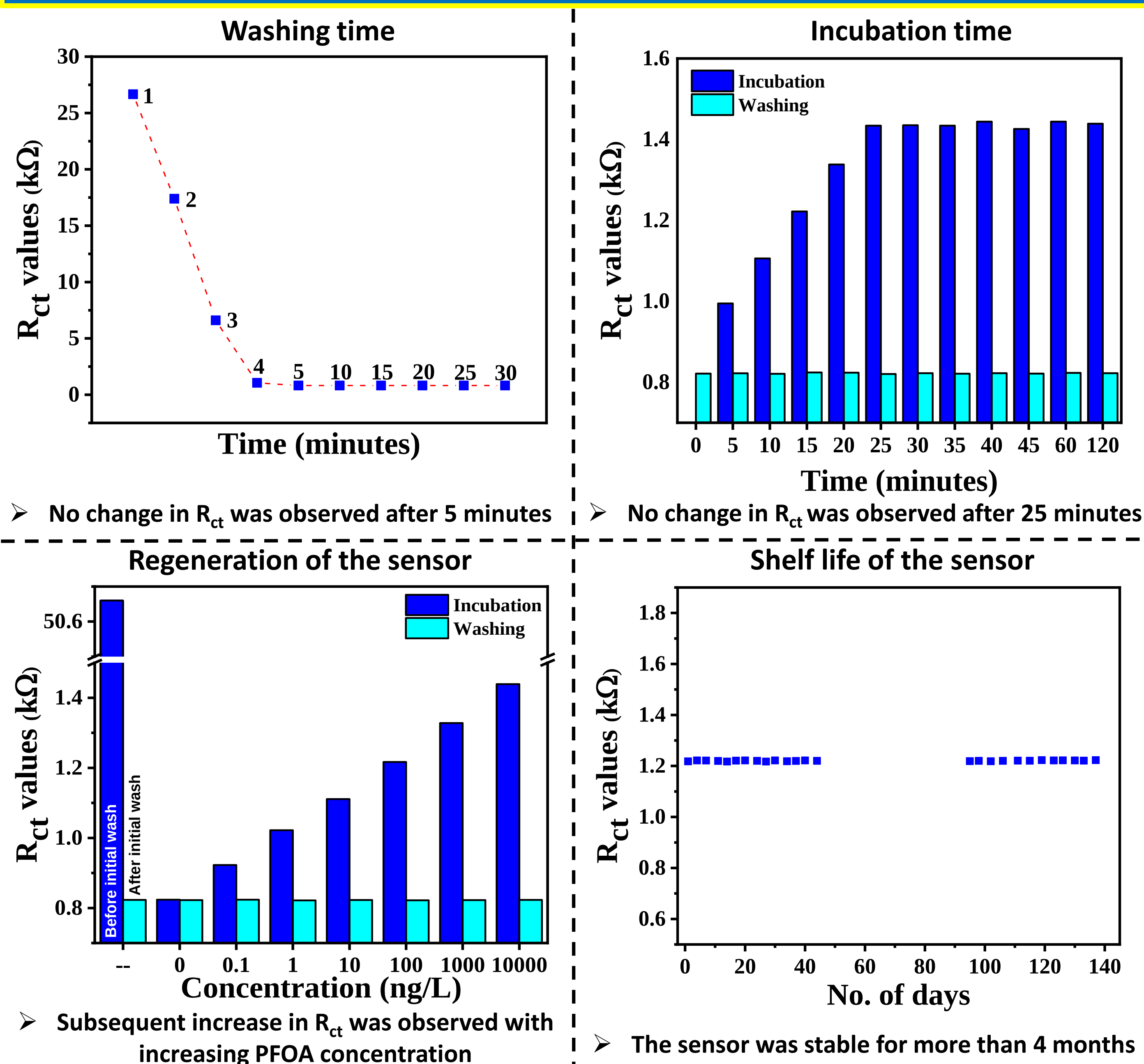
Printing and preparing the MIP sensors



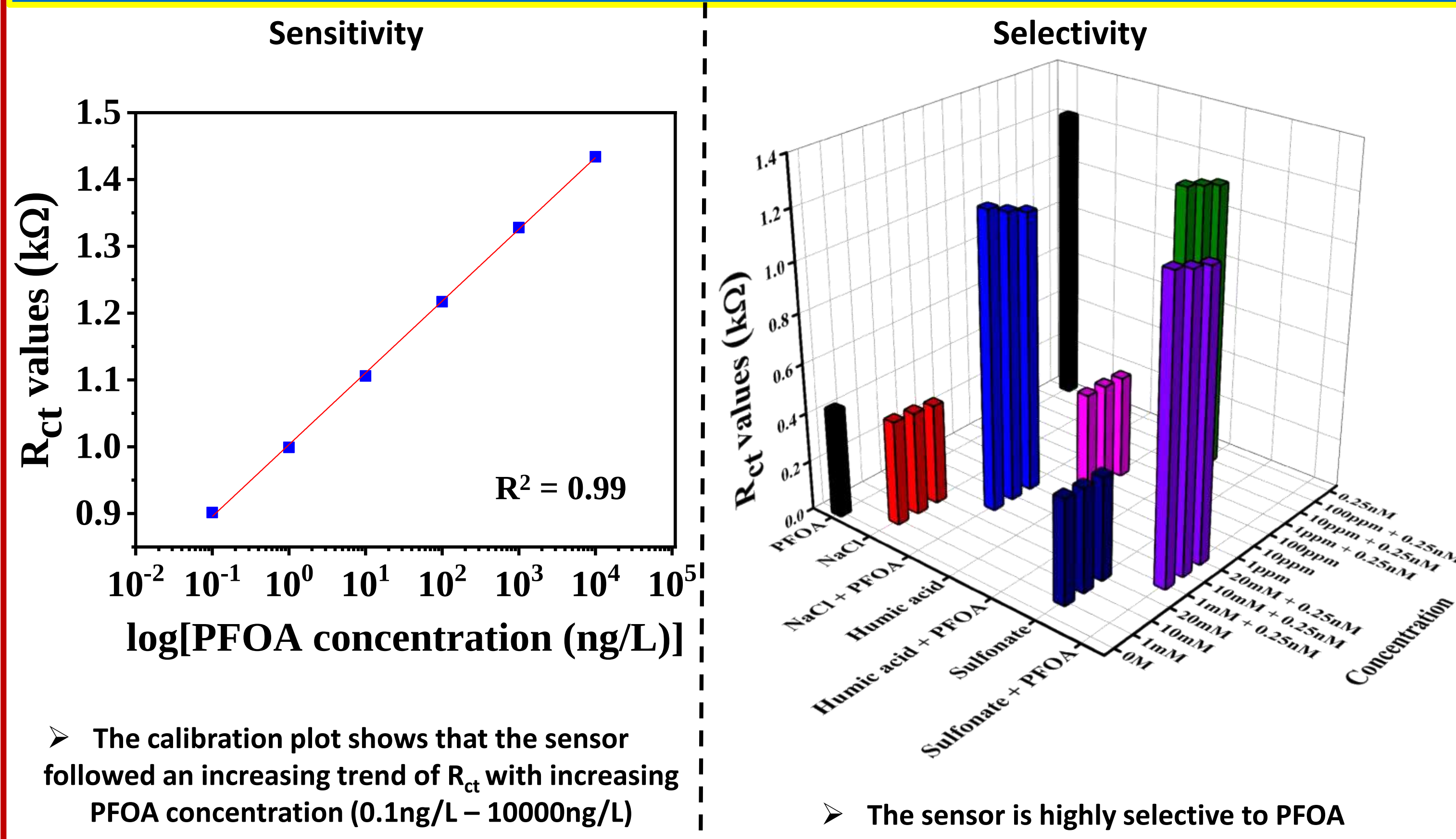
Characterization of the MIP sensors



Optimization of the MIP sensor



Results



References

- Amin, N., Chen, J., He, Q., Schwartz, J. S., & Wu, J. J. (2024). Ultra-sensitive and rapid detection of perfluorooctanesulfonic acid by a capacitive molecularly-imprinted-polymer sensor integrated with AC electrokinetic acceleration. *Sensors and Actuators B: Chemical*, 420, 136464.
- Parambil, A. M., Priyadarshini, E., Paul, S., Bakandritsos, A., Sharma, V. K., & Zboril, R. (2025). Emerging Nanomaterials for Per-and Polyfluorinated Substances Detection—A Review. *Journal of Materials Chemistry A*.

Acknowledgements

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