

Magnetic carbon black modified with molecularly imprinted polymer for the selective extraction and determination of carvacrol

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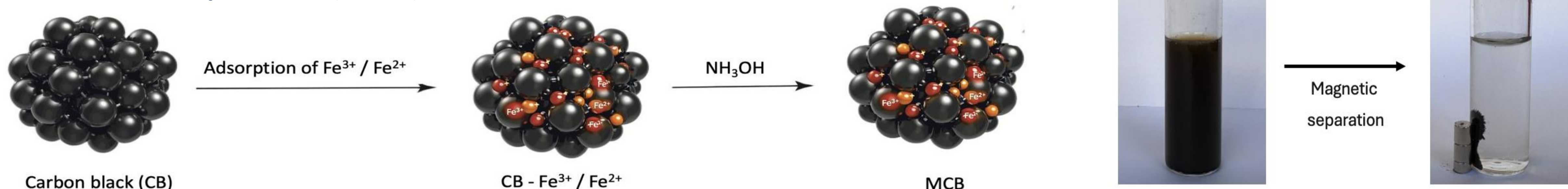
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Introduction

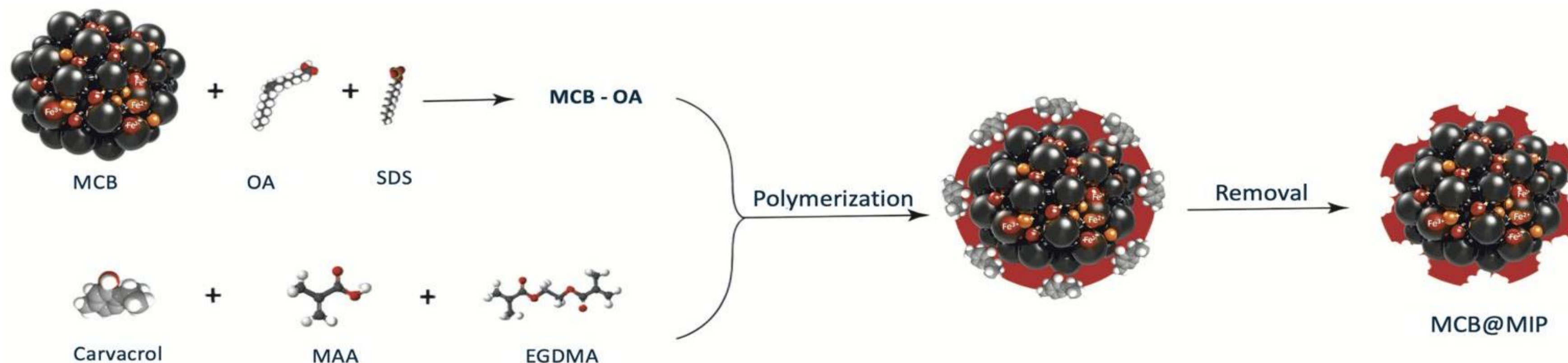
This work aims to develop a multifunctional magnetic carbon black-based molecularly imprinted polymer (MCB-MIP) for the selective extraction and detection of thymol in essential oils. The proposed platform combines magnetic separation with molecular imprinting technology to achieve high selectivity, rapid extraction, and sensitive quantification of thymol in complex matrices.

Materials and methods

Magnetic carbon black synthesis (MCB)

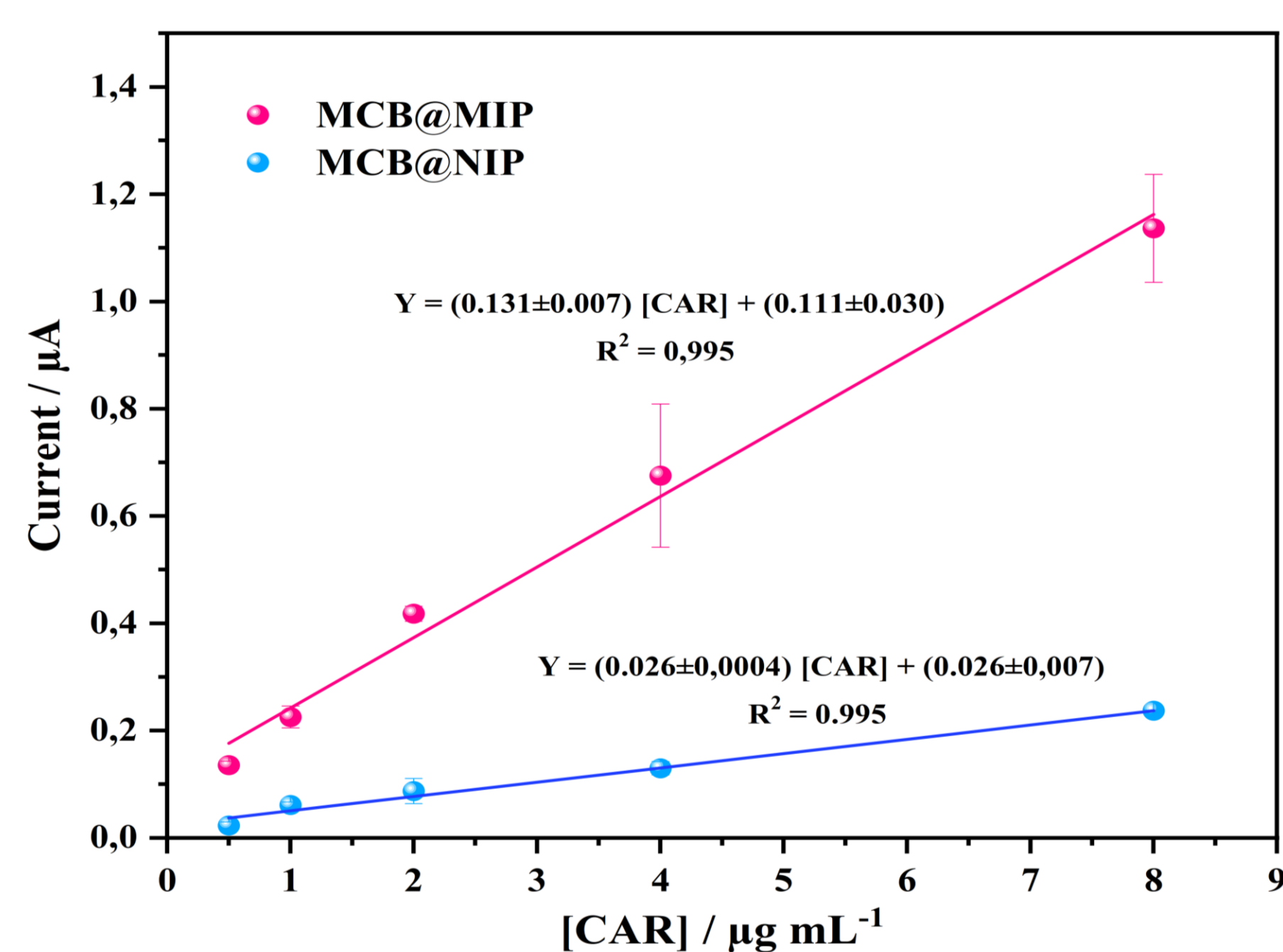


Synthesis of MCB@MIP

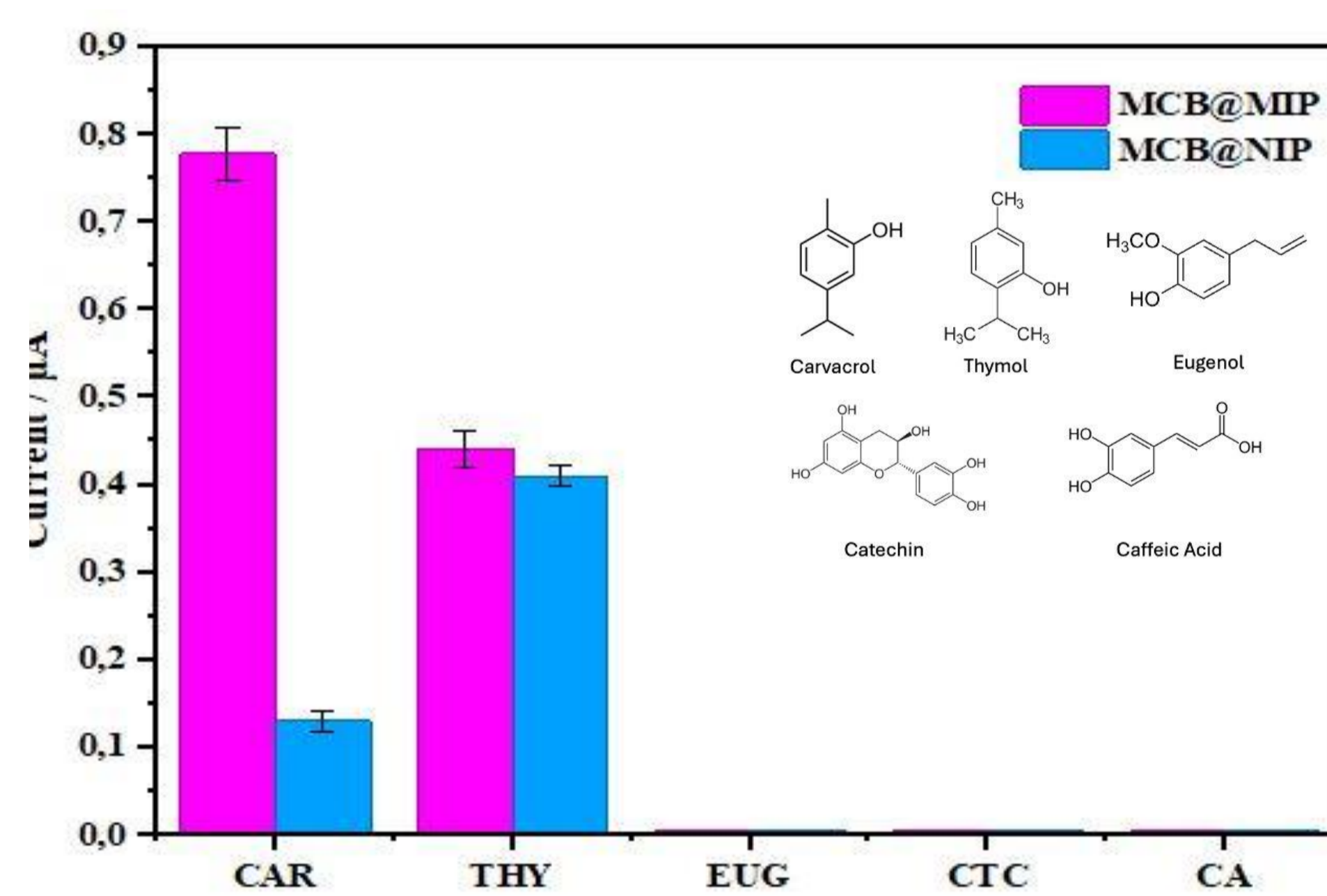


Results and discussion

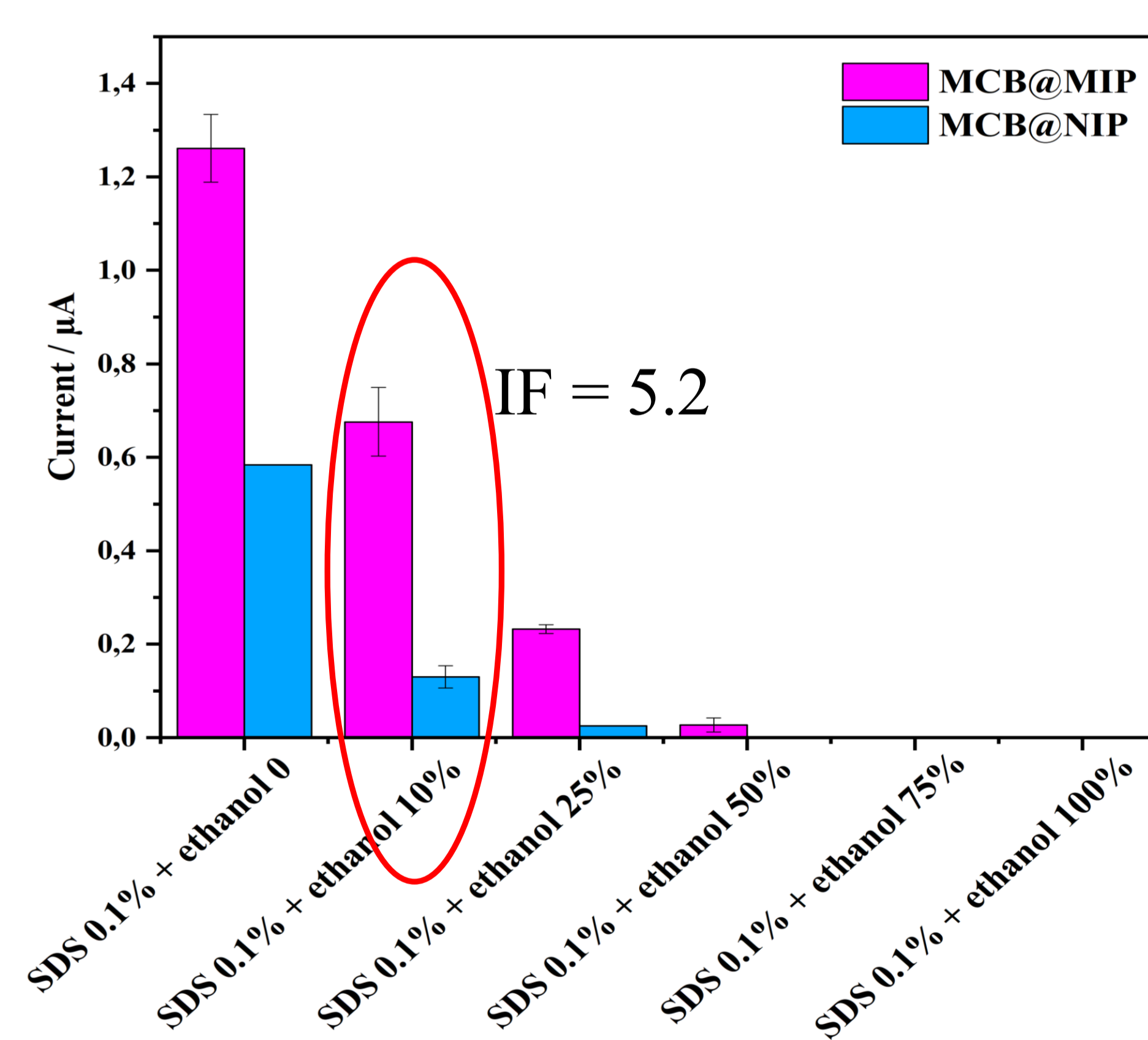
✓ Calibration curve for CAR using MCB@MIP and MCB@NIP



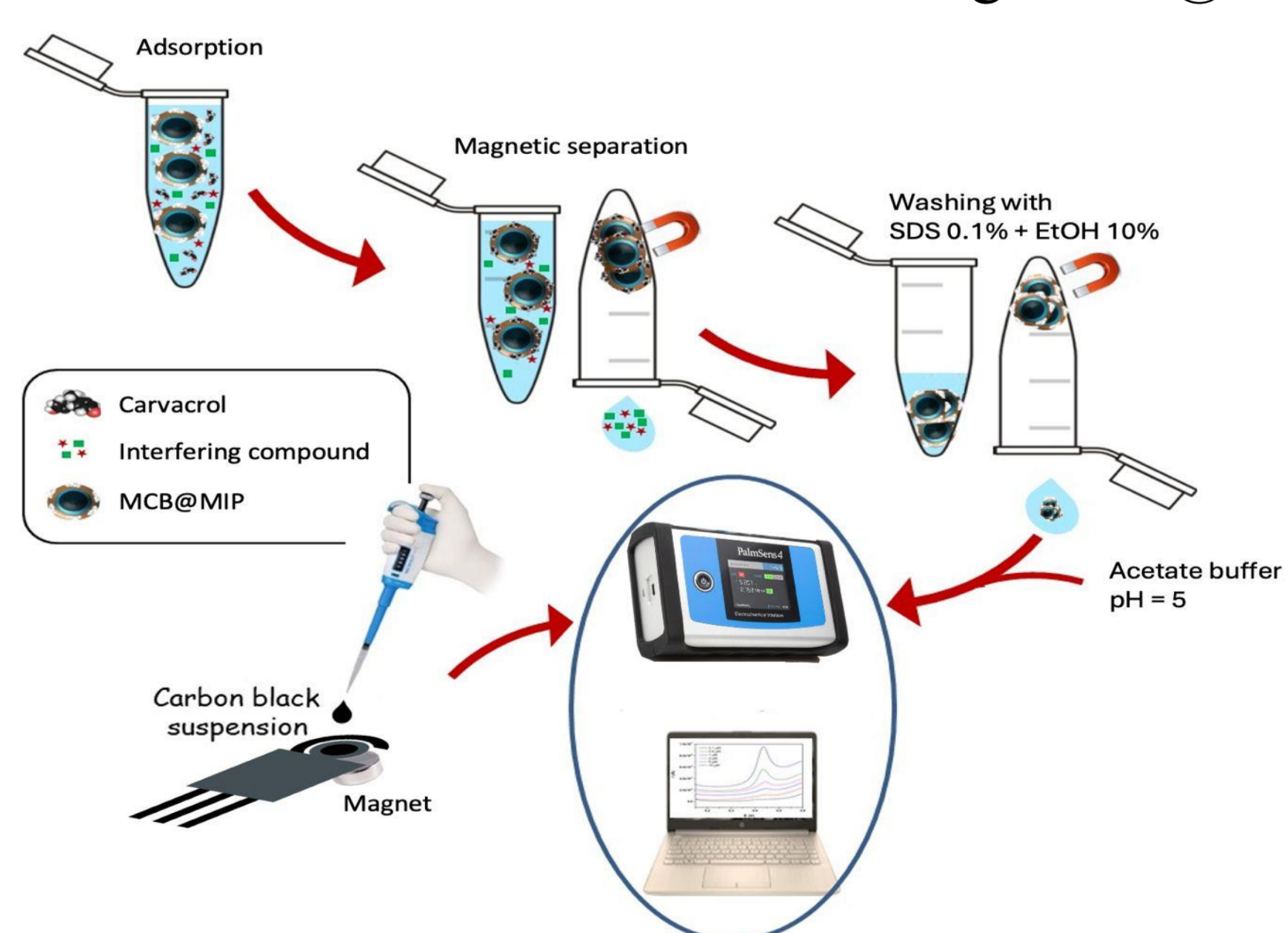
✓ Selectivity of MCB@MIP



✓ Optimization of imprinting factor (IF)



✓ Procedure for carvacrol detection using MCB@MIP



Conclusions

- ✓ MCB-MIP was successfully developed for selective carvacrol detection.
- ✓ The material showed rapid magnetic separation and high adsorption efficiency.
- ✓ The platform demonstrated good sensitivity and selectivity in complex essential oil samples.