

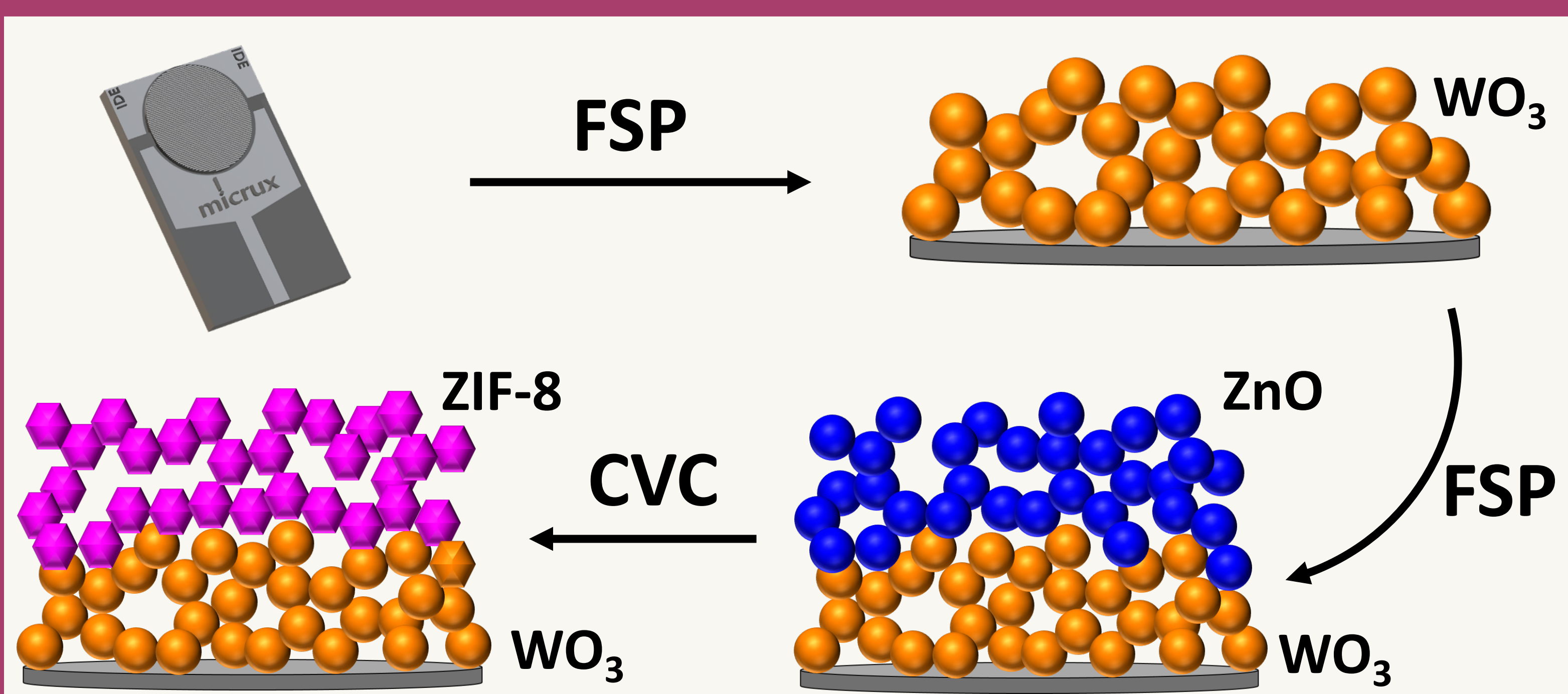
Hierarchical metal oxide/metal organic framework morphology for chemiresistive gas sensing application



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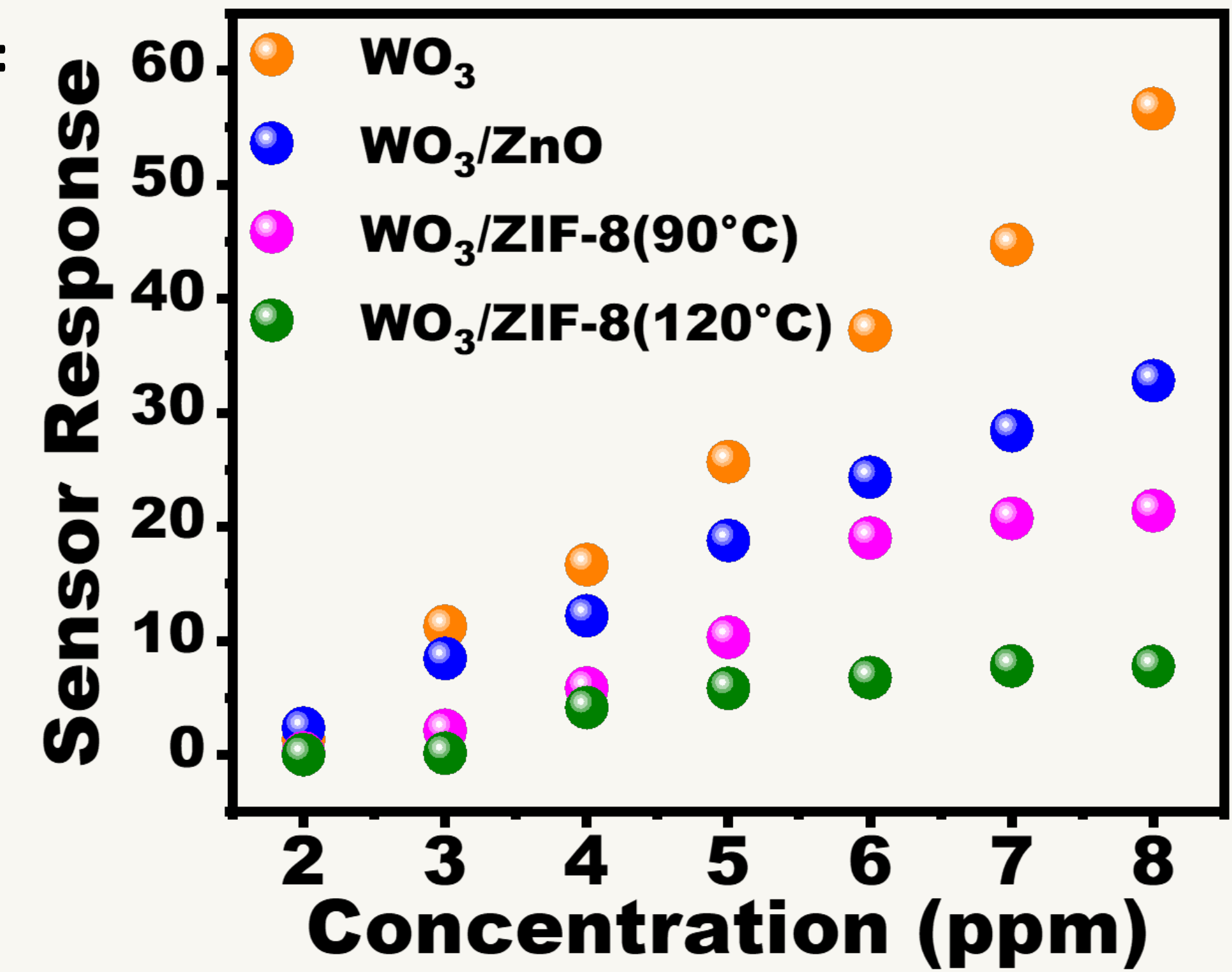
SENSOR FABRICATION



$$\text{Sensor Response} = \frac{R_{air}}{R_{gas}} - 1$$

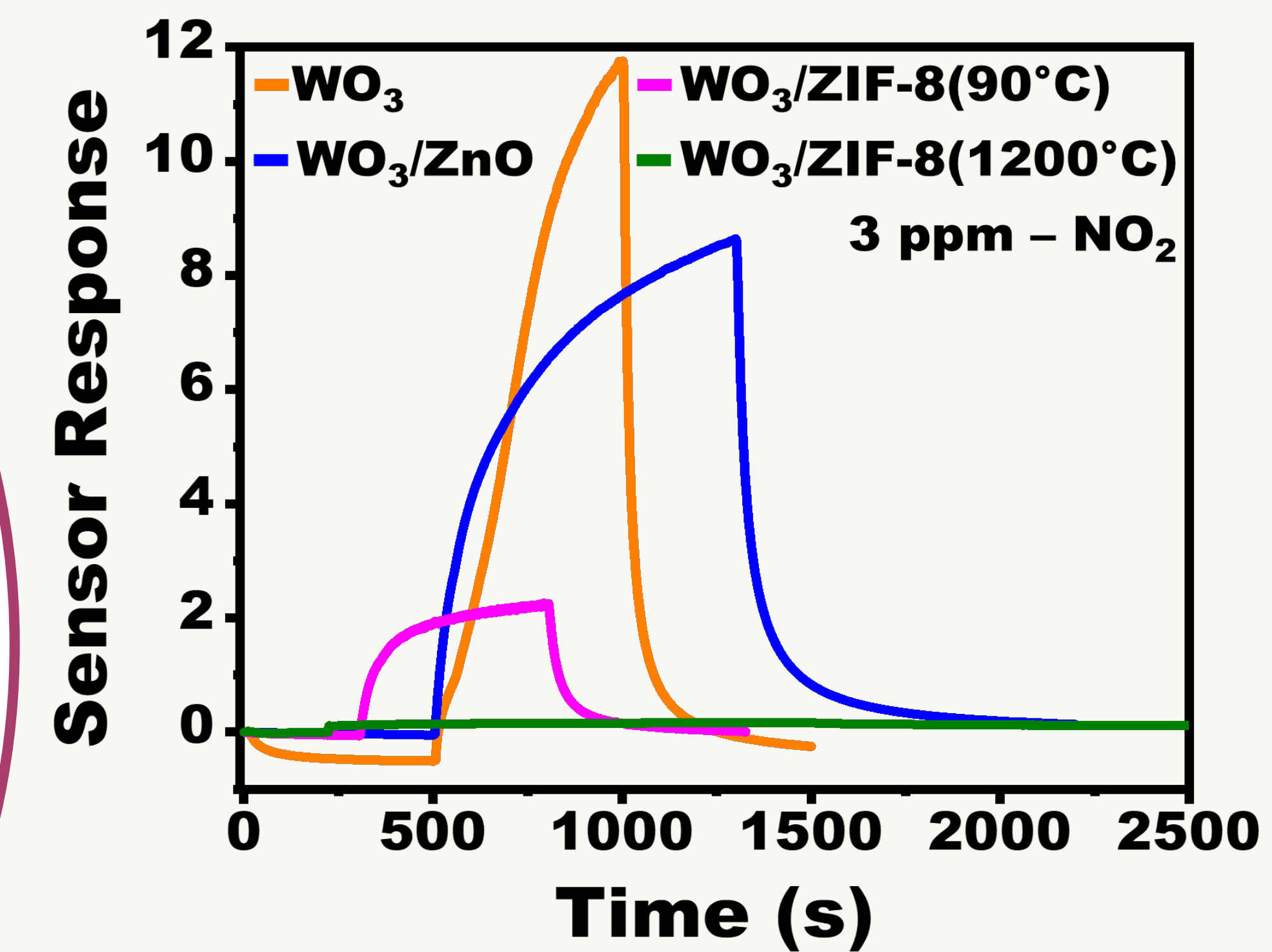
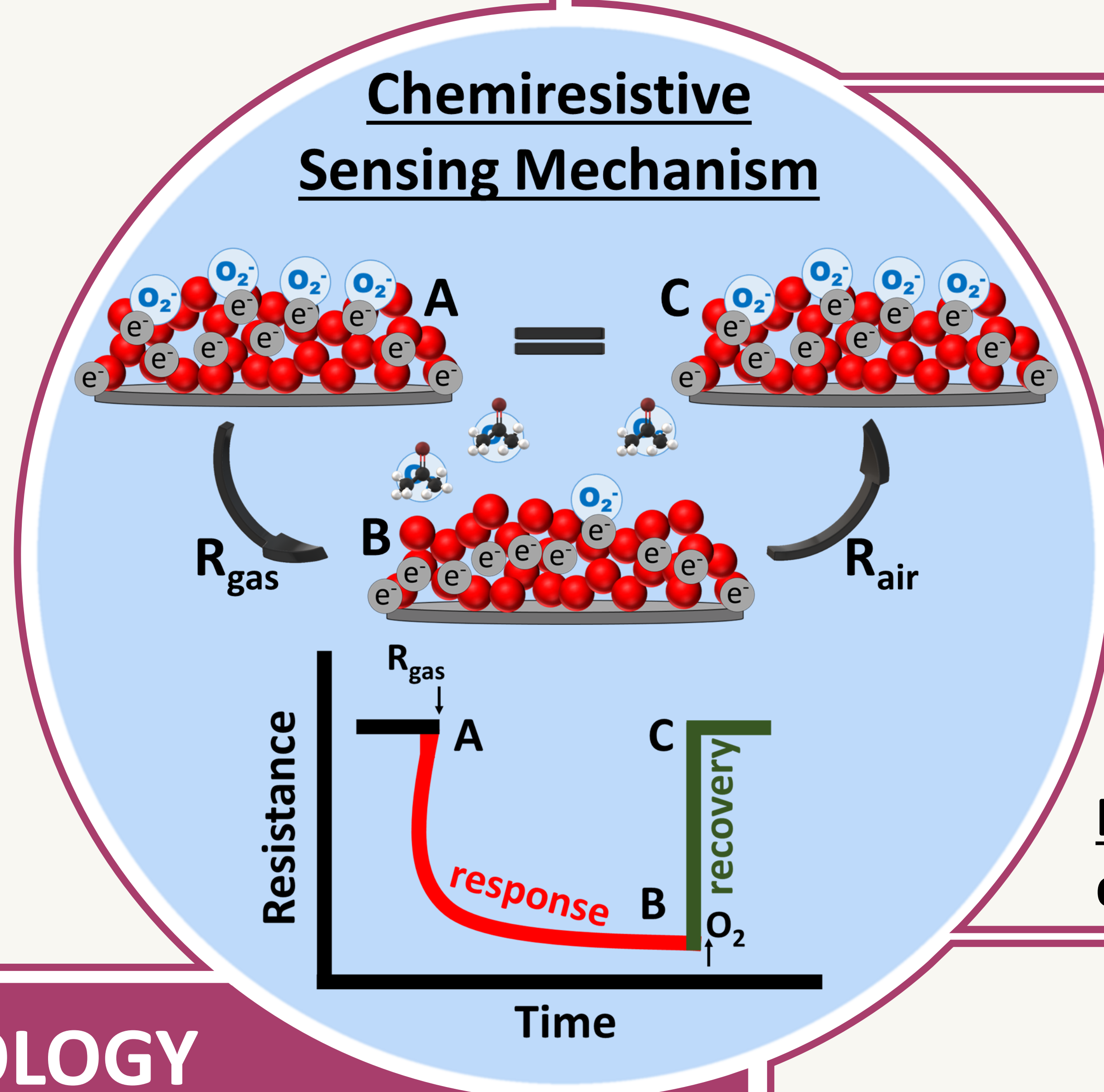
Calibration plot represents linearity in sensor response as a function of concentration

RESULTS



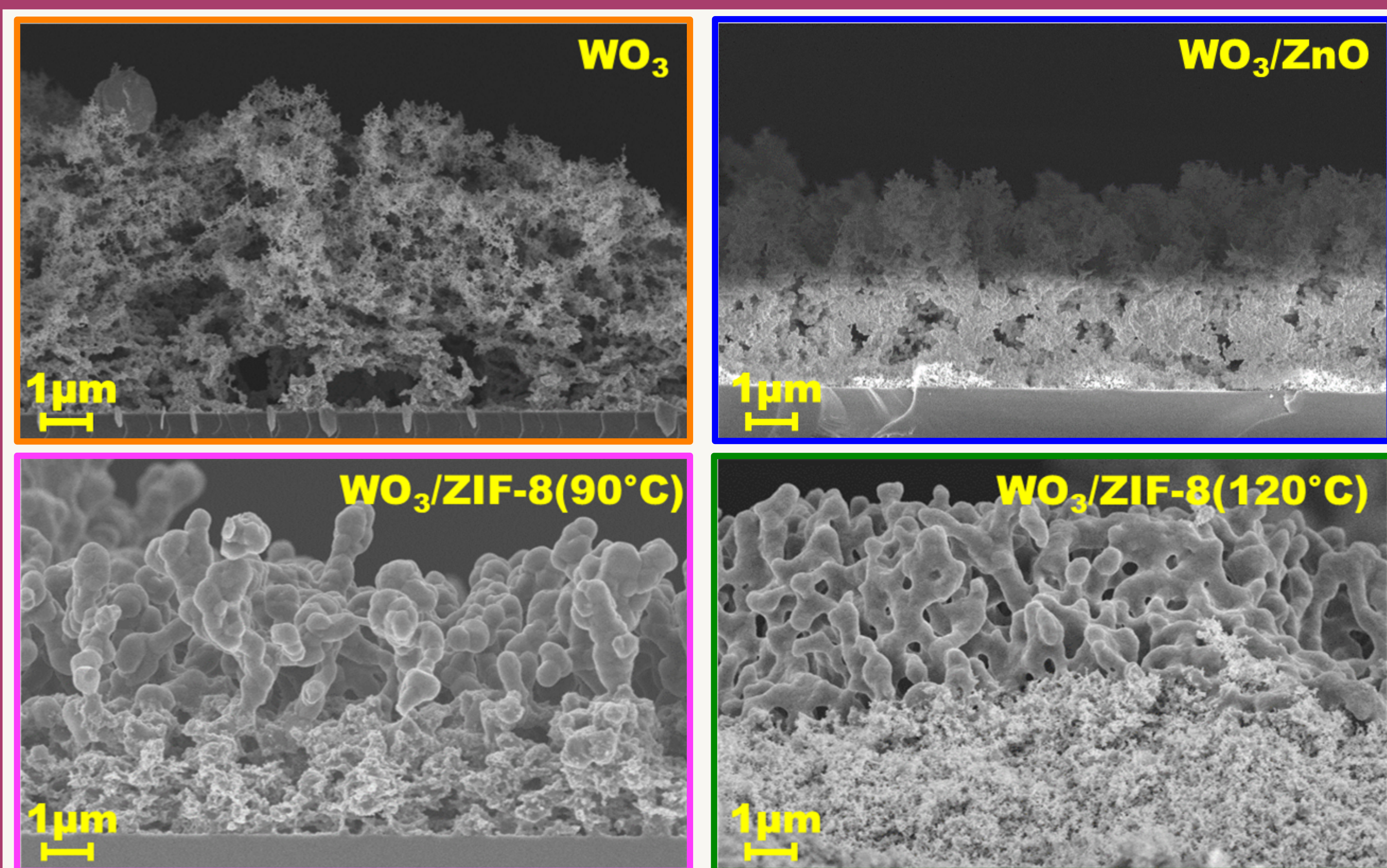
Flame spray pyrolysis (FSP) is employed to synthesize metal oxide films from volatile metal to form nano-oxide layer

Chemical Vapour Conversion (CVC) is employed to convert the top metal oxide layer to metal organic framework (MOF) using the appropriate organic linker

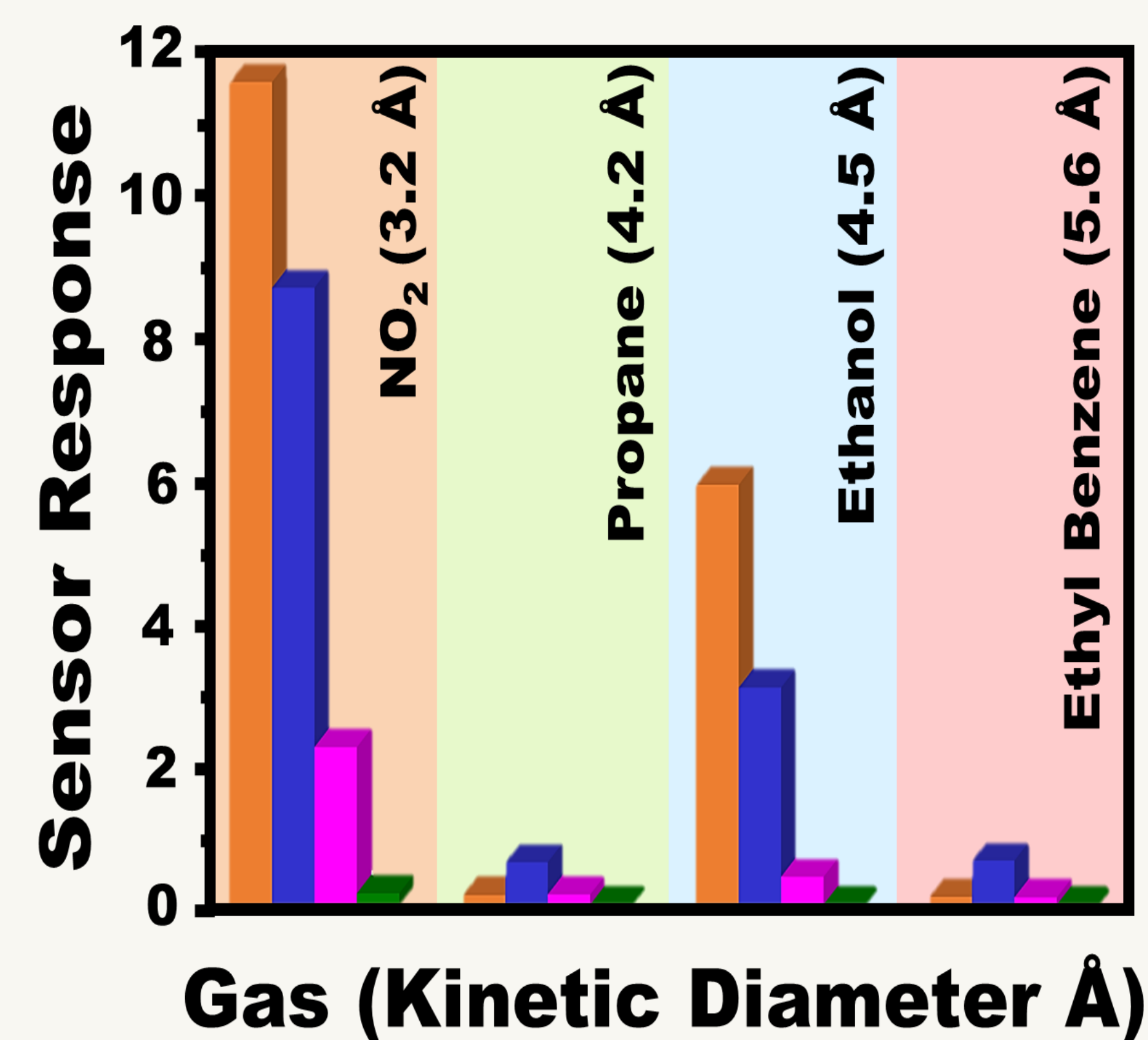


Dynamic response of different layers describes the influence of ZIF-8 layer

SENSOR MORPHOLOGY



Bar plot represents the response of the fabricated sensors towards 3 ppm of different gases



CONCLUSIONS

- The fabricated sensor shows good selectivity towards NO₂ and a wide linear range
- Limit of detection = 0.1 ppm

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References

- Righettoni, M., et al. "Si:WO₃ sensors for highly selective detection of acetone for easy diagnosis of diabetes by breath analysis." (2010) *Analytical chemistry*
- Bo, R., et al. "Hierarchical Metal-Organic Framework Films with Controllable Meso/Macroporosity." (2020) *Advanced Science*

Acknowledgment

