

E-Textiles for Gas Sensing and Novel MOF-POM Hybrid Materials

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Electronic textiles (e-textiles) are fabrics coated with electrically conductive materials. A conductive coating has been developed by hydrothermally depositing Bi(HHTP), onto textile substrates using bismuth acetate and the organic linker HHTP. These Bi(HHTP)coated textiles not only detect H_2S via chemiresistive changes but also selectively adsorb it, differentiating H_2S from other common pollutants. The sensor response is strongly dependent on gas concentration, showing promise as a dual-function platform for detection and uptake.^{1,2}

We also attempted to synthesize a novel hybrid material by combining Bi(HHTP) MOF with phosphotungstic acid ($\text{H}_3\text{PW}_{12}\text{O}_{40}$), creating a MOF–POM composite whose electrical conductivity is highly sensitive to water content. These Bi(HHTP)–POM hybrids remain largely unexplored.

Future work will expand to other metal nodes and different POM species, shifting focus from gas sensing to catalytic applications, such as electrocatalysis.

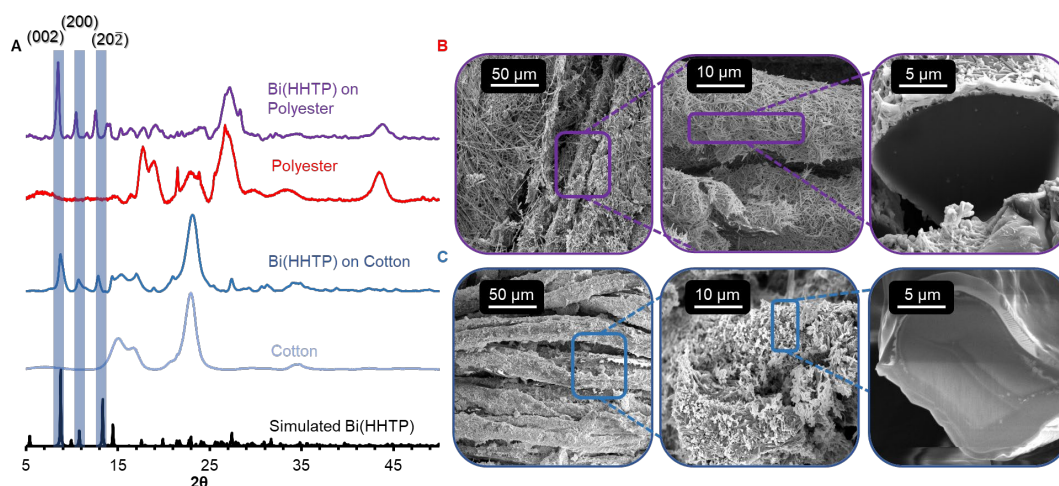


Figure 1: a) pXRD patterns; b) SEM images of Bi(HHTP) on textiles.

References:

- 1) M. K. Smith, K. A. Mirica, J. Am. Chem. Soc. 2017, 139, 16759–16767.
- 2) A. Aykanat, C. G. Jones, E. Cline, R. M. Stolz, Z. Meng, H. M. Nelson, K. A. Mirica, ACS Appl. Mater. Interfaces 2021, 13, 60306–60318.

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