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Electron Beam Crosslinked Au-nanoparticle Films for Sensor Array Patterning ELIZABETH COVINGTON, CAGLIYAN KURDAK, FOREST BOHRER, HUNGWEI CHANG, EDWARD T. ZELLERS, University of Michigan — We have fabricated chemiresistors, arranged in a 2x2 array with 4 μm spacing between the sensors, for use in a micro-gas chromatography (μ-GC) system. To discriminate between analytes, each sensor should be coated with a different thiol coated Au-nanoparticle film. Due to their close spacing, it is not possible to pattern the sensors with different films with traditional film coating methods. Electron beam exposure crosslinks the nanoparticles and renders the film insoluble, and it possible to selectively expose a single sensor in an array. After crosslinking, the remaining film can be rinsed away leaving one coated sensor. This process can be repeated for different films until all sensors in the array have a distinct coating. Using this technique we have made the smallest chemiresistor array with four different films to date. The sensors were characterized by four volatile organic compounds and exhibit different response patterns making them suitable for μ-GC applications.

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