

A highly selective electron affinity facilitated H₂S sensor

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Video Byte

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Abstract

Nature is everything around us, and it is essential to our survival. But air pollution threatens to become its undoing, causing harm to nature and illness and death to humankind. Among numerous toxic gases, hydrogen sulfide - H_2S - is unique due to its industrial and natural origin, as well as its high toxicity. Arising primarily from oil rigs and catastrophic flooding, H_2S has severe effects on the respiratory and nervous system, making early environmental detection essential. Although many detection techniques exist, they suffer from large size, low sensitivity, and high cost. With this in mind, scientists from the research group of Dr. C.V. Yelamaggad at CeNS Bangalore designed novel materials capable of H_2S sensing at very low concentrations. The functional organic materials, called tris-hydrazones, were fabricated by Professor Khaled Salama's group from King Abdullah University of Science and Technology. The device senses H_2S gas selectively in the presence of various other gases, protecting humans from fatal harm. And importantly, sensing can be performed in the gaseous phase at a range of 1 part per billion, with little change in sensitivity for at least six months. With easy manufacturing steps, a low limit of detection, small size, and high sensitivity and selectivity, this sensor has an edge over other H_2S -sensing devices.