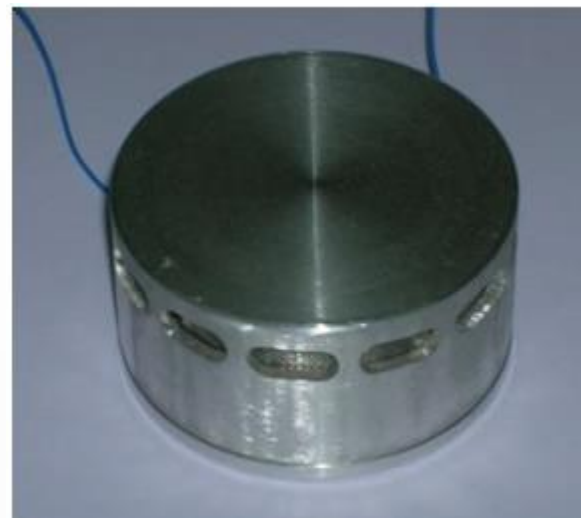


Portable Room Temperature Sulfur Dioxide Sensor

Gas sensors are usually operated at high temperature to achieve fast response and reversibility and this leads to shorter lifetime of the sensor. Nanocrystalline SnO₂ thin films fabricated from the thermal decomposition of Langmuir Blodgett (LB) film precursor, exhibit room temperature gas sensitivity comparable to that required for air quality monitoring. LB technique offers control over SnO₂ film thickness and crystallite size. By controlling the crystallite size and film thickness room temperature operation is achieved. The sensor is specific to SO₂ gas at room temperature and shows fast response and recovery without any carrier gas flow. The stability studies indicated that these sensors are stable at least for a year with no significant change in sensitivity.



ADVANTAGES

- Room temperature operation, low power requirement and portable.
- Reliable over a period of 1 year.

APPLICATIONS

- Sulfur- Iodine cycle for Hydrogen production
- Coal based power plants
- Industries where sulfuric acid at high temperature is used
- Pollution monitoring agencies

SO ₂ detection range	1-30 ppm
Operating temperature	Room temperature
Safe operating temperature	25-50°C
Response time (time to reach 90% of the resistance change)	50 sec
Recovery time (time to reach 10% of the resistance change)	30 min
Response at 2 ppm SO ₂ $[(R_{gas} - R_{air}) \times 100] / R_{air}$	80-100%
Selectivity for SO ₂ (comparison to CH ₄ , CO, NH ₃ , NO ₂ , H ₂ etc.)	Detectable increase in current only for SO ₂ among these gases
Life time under operating conditions	~ 1 year