



Next Generation Sensor Materials

Applications with the Trace Detection of Illicit Materials

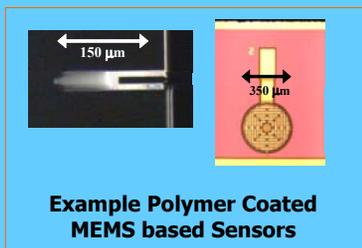


Program Goal

- Design polymeric and nanostructured materials to maximize the selectivity & sensitivity of detectors used to monitor illicit substances

Illicit Substances of Interest

- Chemical Agents
- Explosives
- Biological Agents
- Narcotics

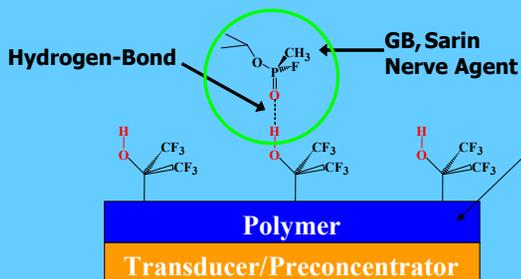


Results

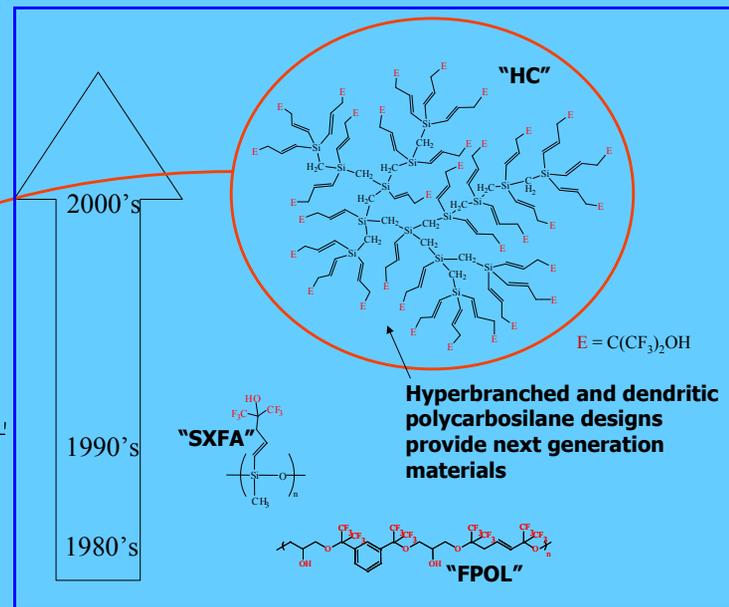
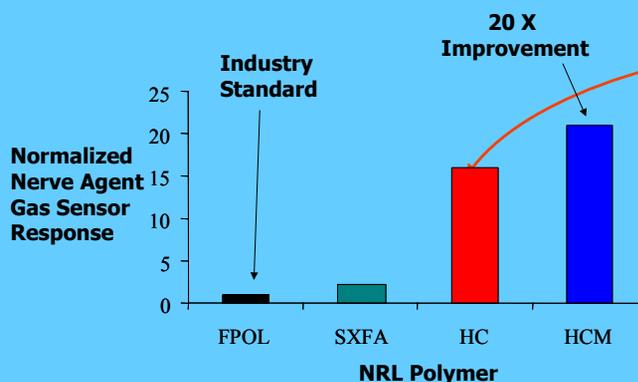
- New classes of chemoselective materials with optimal physicochemical properties including high thermal and chemical stability and low viscosity.
- Dramatic improvement in sensitivity and selectivity for detection of chemical agents
- Orders of magnitude improvement in trace detection of explosives

Transition

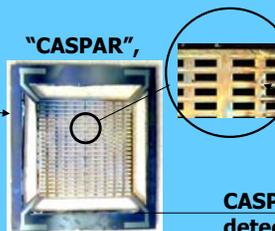
- 6 Recent related NRL patent applications
- 3 companies have recently licensed 4 of these technologies
- 2 Materials Transfer Agreements
- 2 CRADA's



Functionalized polymers used to concentrate illicit substances for transducer, trapping/preconcentrator, or chromatography applications



6 μm thick device provides a low thermal mass for rapid thermal cycling



Flow through design

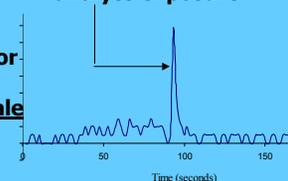
CASPAR attached to detector air intake

CASPAR is a micromachined preconcentrator coated with a hyperbranched polymer, to provide high flow collections of airborne illicit substances for enhanced trace detection



CASPAR enhanced detector signal for analyte exposure

Detector Signal Log scale



CASPAR is readily incorporated into commercial detection equipment to markedly enhance trace detection of explosives & CW agents