

The CUNY Center for Advanced Technology In Photonics Applications (CUNY CAT)
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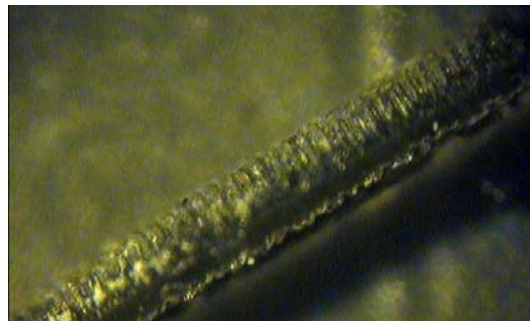
Fiber Optic Sensors for Real-time Screening and Analysis of Gaseous Environments

A new filter technology using fiber optic sensors for the real time screening and analysis of gaseous environments is being developed at CUNY's Center for Advanced Technology in Photonics Applications (CUNY CAT).

Conventional systems employ a pump-filter system, where air is drawn through a filter to concentrate the "unknown". Although widely used, this approach suffers from the requirement of recovering and replacing filters at regular intervals and performing analyses in laboratories removed from the sampling site (not real time).

These fiber optic filter sensors eliminate many problems with existing methodology and dramatically increase the measurement sensitivity by replacing conventional collection filters with an assembly which has special optical fibers woven into its filter media. Airflow through the individual optical fiber filters can be adjusted through the filter weave. Individual fibers can monitor individual or multiple contaminants. Different fibers within the same filter can be tailored to monitor many different species in the same filter.

Fiber Optic detection filters are based on Bragg diffraction gratings which are patterned into the fiber's cladding. They detect various gases using only optical techniques to "interrogate" the fiber which are made specific to an unknown by the addition of specific reporters. Exposure to radioactive materials (beta and gamma radiation) can also be detected by the incorporation of suitable reporters.



Bragg grating patterned into cladding of 180 μm diameter optical fiber

Applications

- Mass transit
- Power plants
- Hospitals
- Home Land Defense

Advantages

- Real-time
- Tailored to specific analytes
- Variable architecture
- High Sensitivity
- Can be used for CBNR detection

This technology opportunity sheet describes continuing efforts in this area. Several patents may have been issued or are pending and which may be available for licensing.

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