

MEH-PPV film thickness influenced fluorescent quenching of tip-coated plastic optical fiber sensors

ABSTRACT

The performance of plastic optical fiber sensors in detecting nitro aromatic explosives 1,4-dinitrobenzene (DNB) have been investigated by fluorescence spectroscopy and analyzed by using fluorescence quenching technique. The plastic optical fiber utilized is 90 degrees cut tip and dip-coated with conjugated polymer MEH-PPV poly[2-methoxy-5-(2-ethylhexyloxy)-1,4-phenylenevinylene] thin films for detection conjugants. The thicknesses of the MEH-PPV coating were varied to improvise the sensitivity whilst slowly reducing the fluorescence intensity. It was shown that fluorescence intensity from thinner film decreased by (82% in 40 s) in the presence of DNB signifying an improvement of 28% reduction with time 13 s less than that of the thicker film.

Keyword: Plastic optical fiber tip; Film thickness; Explosive; Fluorescence quenching