

Optical test strip for trace Hg(II) based on doped sol-gel film.

Abstract

Optical test strip based on the use of Br-PADAP as a sensitive reagent immobilised into sol-gel thin film for detection of Hg(II) in aqueous solution had been thoroughly carried out. It has a square-sensing zone (1.0 cm × 1.0 cm) containing the sensitive reagent necessary to produce response to trace level of mercury. This method offer sensitivity and simplicity in detecting Hg(II) as no prior treatment or extraction is required. A linear response was attained in the Hg(II) concentration in the range of 0.5–2.5 ppm with calculated limit of detection of 6.63 ppb. This method also showed a reproducible result with relative standard deviation (R.S.D.) of 2.15% and response time of ~5 min. Interference studies showed that Al(III), Co(II) and Ni(II) significantly interfered during the determination. The developed sensor has been validated against Atomic Absorption Spectroscopy method and proven comparable.

Keyword: Optical fibre chemical sensor; Doped sol-gel thin film; Hg(II) detection.