

Development of optical test strip for rapid determination of trace arsenic using immobilized gallocyanine

Abstract

Irreversible test strip for the determination of arsenic has been developed. It has a rectangular sensing zone containing all the reagents necessary to produce a selective response to arsenic and formed by immobilized gallocyanine inside chitosan membrane. This method offer sensitivity and simplicity in detecting arsenic as no prior treatment or extraction is required. A linear response was attained in the arsenic concentration in the range of 10 to 30 ppm with calculated limit of detection of 0.96 ppm. This method also showed a reproducible result with relative standard deviation (RSD) of 0.87% and response time of ~5min. Interference studies showed that Pb(II) and Ni(II) significantly interfered during the determination. The developed sensor has been validated against Atomic Absorption Spectroscopy method and proven comparable.

Keyword: Arsenic detection; Optical test strip; Immobilized chitosan membrane