

Development of a flow-through optosensor for determination of Co(II)

Abstract

A flow-through optical fibre chemical sensor for the determination of Co(II) at trace level using immobilised 2-(4-pyridylazo)resorcinol (PAR) as the reagent phase is proposed. PAR is physically adsorbed onto XAD-7. This method provided a great sensitivity and simplicity with wide linear response range from 1×10^{-2} to 1×10^3 ppm and detection limit of 20 ppb. This method also showed a reproducible result with relative standard deviation (R.S.D.) of 1.78% and response time of 5 min. The response towards Co(II) was also reversible using acidified KCl as the regenerating solution. Interference studies showed that Cr(III) significantly interfered during the determination. Excellent agreement with reference to inductively coupled plasma optical emission spectroscopy (ICPOES) method was achieved when the developed sensor was applied for determination of Co(II) in aqueous samples.

Keyword: Flow injection analysis (FIA), Co(II) detection, Optical fibre sensor