

Optical fibre chemical sensor for trace vanadium(V) determination based on newly synthesized palm based fatty hydroxamic acid immobilized in polyvinyl chloride membrane

ABSTRACT

Fatty hydroxamic acid (FHA) immobilized in polyvinyl chloride (PVC) has been studied as a sensor element of an optical fibre chemical sensor for V(V). By using this instrument, V(V) in solution has been determined in the log concentration range of 0–2.5 (i.e. 1.0–300 mg/L). The detection limit was 1.0 mg/L. The relative standard deviation (R.S.D.) of the method for the reproducibility study at V(V) concentration of 200 mg/L and 300 mg/L were calculated to be 2.9% and 2.0%, respectively. Interference from foreign ions was also studied at 1:1 mole ratio of V(V):foreign ions. It was found that, Fe(III) ion interfered most in the determination of vanadium(V). Excellent agreement with ICP-AES method was achieved when the proposed method was applied towards determination of V(V).

Keyword: Optical fibre, PVC membrane, V(V) sensor, Fatty hydroxamic acid