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Title : Highly sensitive fluorescence optode based on polymer inclusion membranes for determination of Al(III) ions

Author : Suah, F.B.M., (Universiti Sains Malaysia)
Ahmad, M., (Universiti Sains Islam Malaysia) ,
Heng, L.Y., (Universiti Kebangsaan Malaysia)

Abstract : This paper reports the use of a polymer inclusion membranes (PIMs) for direct determination of Al(III) ions in natural water by using a fluorescence based optode. The best composition of the PIMs consisted of 60 wt.% (m/m) poly (vinyl chloride) (PVC) as the base polymer, 20 wt.% (m/m) triton X-100 as an extractant, 20 wt.% (m/m) dioctyl phthalate (DOP) as plasticizer and morin as the reagent, was used in this study. The inclusion of triton X-100 was used for enhancing the sorption of Al(III) ions from liquid phase into the membrane phase, thus increasing the optode fluorescence intensity. The optimized optode was characterized by a linear calibration curve in the range from 7.41×10^{-7} to 1.00×10^{-4} molL⁻¹ of Al(III), with a detection limit of 5.19×10^{-7} molL⁻¹. The response of the optode was 4 min and reproducible results were obtained for eight different membranes demonstrated good membrane stability. The optode was applied to the determination of Al(III) in natural water samples. The result obtained is comparable to atomic absorption spectrometry method. © 2014 Springer Science+Business Media New York.

Subject : Aluminium(III) determination; Natural waters; Optode; Polymer inclusion membrane

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