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Highly Selective Polymeric Fluorescence Sensor for Cd(II) Ions

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Abstract : In this work, a polymer based highly selective fluorescence sensor membrane was prepared by the photopolymerization technique for the determination Cd(II) ion. Sensor characteristics such as effects of pH, response time and foreign ions on the fluorescence intensity of the sensor were also studied. Under optimized conditions, the polymeric sensor shows a rapid, stable and linear response for $4.45x10^{-9}$ mol L^{-1} - $4.45x10^{-8}$ mol L^{-1} Cd(II) ion with the detection limit of $6.23x10^{-10}$ mol L^{-1}. In addition, sensor membrane was selective which is not affected by common foreign metal ions. The concentrations of the foreign ions such as $Pb^{2}+$, $Co^{2}+$, $Ag+$, $Zn^{2}+$, $Cu^{2}+$, $Cr^{3}+$ are 1000-fold higher than Cd(II) ions. Moreover, the developed polymeric sensor was successfully applied to the determination of cadmium ions in food and water samples. This work was supported by Marmara University, Commission of Scientific Research Project.

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