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TECHNIQUE / COATED MANGANESE DIOXIDE ADSORPTION

WINAI POLTHAWEENUKON : INVESTIGATION ON ADSORPTION BEHAVIOR OF  
BARIUM AND RADIUM ON MANGANESE DIOXIDE SURFACE. THESIS ADVISOR :

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The adsorption behavior of Barium and Radium on Manganese Dioxide surface coated on polyamide was studied in order to use as a preconcentration technique for Barium and Radium determinations. The Inductively Coupled Plasma – Atomic Emission Spectrophotometry (ICP – AES) technique was used to determine Barium concentration while the Liquid Scintillation Counter (LSC) technique was used to measure the Radium activity. Firstly Barium adsorption behavior was investigated in order to find out the optimum conditions for Barium adsorption on Manganese Dioxide surface. The optimum conditions obtained were then used as the preconcentration technique for Radium. It was found that by using the corn - seed shape of polyamide as the supporting material for Manganese Dioxide, higher percentage of Barium adsorption (80 – 90%) can be observed as compared to the disc - flatted shape or other shapes. Barium is adsorbed at pH 3 – 13, however the highest adsorption value was found for the solution of pH 5 – 7 (89%). With a contacting time of 60 minutes, the adsorption of Barium on Manganese Dioxide was nearly saturated. The amount of adsorbent used depended on the surface area of Manganese Dioxide which was found to be approximately  $0.45 \times 10^{-6}$  mol /cm<sup>2</sup> of Manganese Dioxide surface. Calcium was found to be the main interference that can reduce the adsorption of Barium on Manganese Dioxide surface. Magnesium and Potassium also affected the Barium adsorption but Sodium showed no significant effect on Barium adsorption.

The optimum conditions obtained from the previous studies were used for Radium determination in authentic water sample . The percent recovery of Radium was found to be more than 80 %. However, by using this preconcentration technique for Radium determination in real water sample, a method for interference correction must be considered in order to reduce the error in the determination .