A new solid phase extraction method using hair as a adsorbent has been developed for beryllium(II) prior to its spectrophotometric determination using chrome Azurol S. The effects of various variables such as pH, sample and eluent flow rates, eluent volume and concentration, sample volume, and interfering ions on the quantitative recoveries of beryllium(II) were investigated. The multivariate strategy was applied to screen out the multifactor and estimate the optimum values of experimental factors for the recovery of beryllium(II) using solid phase extraction. Calibration graph was linear in the range of 0.046–20 μg L⁻¹ with correlation coefficient \( r^2 = 0.987 \). The sensitivity (limit of detection (LOD)) and selectivity (preconcentration factor) of the proposed methods were 0.028 and 50, respectively. Validity and accuracy of the developed solid phase extraction method were checked by analysis of a certified reference water for Trace Elements (TM-28.3) and a real water samples by standard addition method, the relative recoveries >96% were obtained. The method was successfully applied for the determination of beryllium(II) in natural water samples.

**Keywords:** Beryllium; Chrome Azurol S; Solid phase extraction; Multivariate study; Spectrophotometry; Water samples

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