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GFAAS method for determination of total chromium in urine

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Abstract Chromium in urine can be regarded as a marker of internal chromium exposure. More frequent effects are observed to the skin, respiratory and renal systems. Occupational exposure to total chromium can be determined by means of workplace atmospheres measurements and biological monitoring (in urine). Because very small quantity is excreted, considerable analytical sensitivity is required for urinary total chromium determinations. This paper describes a new determination method for total chromium in urine using graphite furnace atomic absorption spectrometry (GFAAS) with a background correction. The atomisation temperature used was 2400^{o}C and a cleaning step for graphite furnace after each samples series was realized. The validation of GFAAS method was made in concordance with International Conference on Harmonization (ICH). To determine the performance parameters for the method (linearity, accuracy and precision) standard calibration solutions were used in the concentration range of 10 - 100 µg/L. After validation, total chromium determinations in urine were made to involved personal in pigments obtaining process. The measured values of total chromium are situated between 0.01 – 29.67 µgCr/g Creatinine (under the maximum accepted limit - 30µgCr/g Creatinine).

Keywords: total chromium, urine, GFAAS, validation

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