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Chromium speciation in environmental samples using Dowex M 4195 chelating resin

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Chromium exists in Cr(III) and Cr(VI) oxidation states in aqueous solutions. The properties of these species are different [1]. Trivalent chromium, the main chemical form found in foods, is essential for maintaining normal glucose metabolism [2]. Cr(VI) oxidation state is detrimental to health as it may be involved in the pathogenesis of some diseases like liver, kidney, lung and gastrointestinal cancers [3].

A solid phase extraction procedure has been established for chromium speciation in natural water samples. The procedure is based on the solid phase extraction of the Cr(VI)- Dowex M 4195 chelating resin. After oxidation of Cr(III) to Cr(VI) by using H_2O_2, the presented method was applied to the determination of the total chromium. The level of Cr(III) is calculated by difference of total chromium and Cr(VI) levels. The procedure was optimized for some analytical parameters including pH, eluent type, flow rates of sample and eluent, matrix effects etc. The presented method was applied for the speciation of chromium in natural water sample with satisfactory results (recoveries > 95%, RSD's <10%). In the determinations of chromium species, flame atomic absorption spectrometer was used. The results were checked by using various reference standard materials.

References

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