

## SG.15 – Development of an on-line MSPE-ICP-OES method for the preconcentration and speciation of Cr(III)/Cr(VI) in aqueous samples

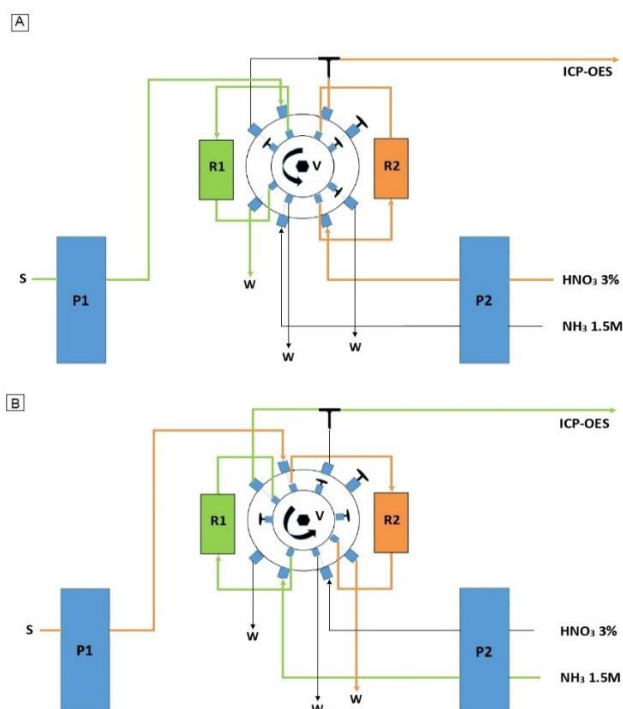
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### Abstract

In this work, a new double-reactor method for the analysis and speciation of trace amounts of Cr(III)/Cr(VI) ions in environmental samples has been developed combining on-line magnetic solid phase extraction (MSPE) with inductively coupled plasma optical emission spectrometry (ICP OES). For the preconcentration and speciation of Cr, a new magnetic graphene oxide (MGO) functionalized with p-sulfanilic acid has been synthesized. This material presents good capacity of adsorption towards Cr(III) and Cr(VI) species. The FI manifold used for on-line preconcentration and elution is shown in Fig. 1. The eight-port valve (V) was changed from position A-B, and vice versa allowing the load of sample of the two reactors (R1 and R2) followed of the elution of Cr(VI) with  $\text{NH}_3$  3.2 % in R1 and total Cr with  $\text{HNO}_3$  2.3 % in R2 to ICP-OES. Subtracting the signal of Cr (VI) to the signal of Cr(III)+Cr(VI), both ions can be determined. Moreover, several flow and chemical variables were optimized by two multivariate central composite designs (CCD). The optimized method offers good sensitivity and precision. The accuracy of the proposed method was verified using certified reference materials. The obtained results were in good agreement with the certified values and high recoveries were achieved for the spiked samples. Thus, the new adsorbent has demonstrated to be useful for the preconcentration and speciation of Cr(III)/Cr(VI).



**Fig. 1.** Schematic diagram of the FI system for the preconcentration and separation of Cr(VI) and total Cr. A) Load of R1 and elution of R2 with  $\text{HNO}_3$ ; B) Load of R2 and elution of R1 with  $\text{NH}_3$

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