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Measurement of iron (III) in waters by microsequential injection solid phase spectrometry using an hexadentate 3-hydroxy4-pyridinone chelator as a color reagent

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An hexadentate 3–hydroxy-4-pyridinone (3,4-HPO), exhibiting a high solubility in water has been previously used as low toxicity chromogenic reagent for iron(III) determination[1]. Due to the 1:1 stoichiometry to achieve six oxygen coordination sphere for iron(III) a better detection limit was achieved. In this work, the same hexadentate 3,4-HPO ligand used for the spectrophotometric quantification of Fe in natural and sea waters was further explored in the development of an automatic micro Sequential Injection Lab-on-Valve (μSI-LOV) method. Using also a previously described approach for in-line pre-concentration with a packed resin in the flow cell [2] a new improved method was designed (Fig.). The chosen resin was Nitrilotriacetic Acid Superflow (NTA) packed into a column in the flow cell to attain solid phase extraction. When combining with the hexadentate 3,4-HPO chromogenic reagent, lead to a merging of advantages, in terms of reagent consumption values and waste production, as no extra elution is required. Overall, there was an improvement in detection limit, reaction sensitivity and time of analysis.

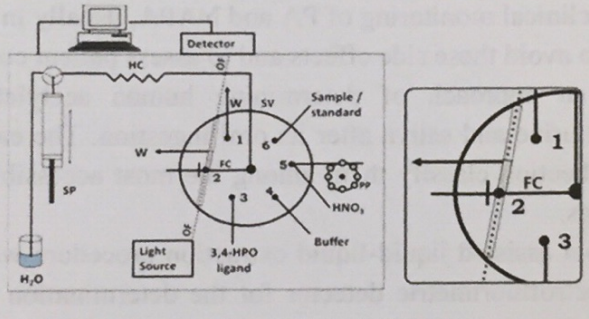

Fig.The μSI-LOV manifold: SV, 6 port selection valve; SP, syringe pump; HC, holding coil; FC, flow cell with resin column packed; OF, optical fibers; W, waste.

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