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Sequential injection system with in-line solid phase mini-column extraction for zinc and copper determination

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Novel approach to simultaneous spectrophotometric determination of zinc and copper with the use of 1-(2-Pyridylazo)-2-naphthol (PAN) as chromogenic reagent is proposed. In the selected conditions, PAN reacts with both analytes giving compounds of similar molar absorption which can be detected at the wavelength (560 nm). A sequential injection system with in-line mini-column for solid phase extraction has been developed to the method implementation; the cationic resin Chelex100 was used as sorbent. The characteristics of the developed system were evaluated and the procedure for zinc and copper determination has been established. Two channels for the sample introduction, with and without the mini-column, allowed the zinc, and sum of zinc and copper quantification, respectively. Zinc was determined directly, after retaining copper on the cationic resin of the mini-column, whereas copper determination was based on the difference between the sum of both analytes and zinc signals. The influence of several potential interferents was studied. This approach was verified by the determination of both analytes in synthetic and certified reference material of water samples, and applied for the determination of the analytes in rain water and soil leachates. The results were compared with those obtained by a reference method.

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