TRACE DETERMINATION OF COBALT IN WATER AND PHARMACEUTICAL SAMPLES BY USING IONIC LIQUID-BASED MICROEXTRACTION-FLAME ATOMIC ABSORPTION SPECTROMETRY

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Several reports have been appeared in literature which ionic liquids (ILs) have successfully been utilized for extraction of metal ions as chelate [1-6]. In all of developed methods, sample preparations of metal ions were performed by using imidazolium ILs and a back-extraction step was often required prior to detection. In this work, a simple microextraction technique based on 1-hexylpyridinium hexafluorophosphate [Hpy][PF₆] hydrophobic ionic liquid was used to preconcentration of trace amounts of cobalt (II) ions as prior step to determination by flame atomic absorption spectrometry (FAAS). In this method, appropriate amount of [Hpy][PF₆] IL was dissolved in a sample solution and a cloudy solution was immediately formed at room temperature in aqueous solution. After centrifuging, the extractant phase was settled to the bottom of the screw-cap conical-bottom polypropylene centrifuge tube. 1-phenyl-3-methyl-4-benzoyl-5-pyrazolone (PMBP) was chosen as chelating agent. Some effective factors that influence the microextraction efficiency were investigated and the optimized microextraction conditions were established. In the optimum experimental conditions, the limit of detection (LOD) of the method and the relative standard deviation (R.S.D) were 1.4 μgL⁻¹ and 1.9 %, respectively. The proposed procedure does not need any anti-sticking agent, heating, long incubation time, cooling before or after centrifugation and back-extraction step prior to detection. The applicability of this approach was validated for the determination of cobalt in natural waters and pharmaceutical samples

References