Application of the Kinetic-Spectrophotometric Method for Co(II) Ion Determination in Baby Tea Samples

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The aim of this work was application of the kinetic-spectrophotometric method for the Co(II) ion determination in baby tea samples. Cobalt is an essential element and it is important for the function of many vital processes, such as the production of erythrocytes, i.e. red blood cells, as well as in the production of antibacterial and antiviral compounds that prevent the occurrence of infections. The method is based on the indicatory reaction of oxidation of para-nitrophenol by hydrogen peroxide which is catalyzed by Co(II) ion in alkaline media at wavelength of 386 nm. The calibration curves were constructed in the interval from 0.059 to 0.59 μg/ml and from 0.59 to 59 μg/ml. Ten commercially available tea samples were used for the optimization and validation of the new kinetic method. Samples prepared by the microwave digestion described by Yeneman and Ikem[1,2]. The kinetic method was successfully applied for Co(II) ion determination with recovery of 94.31 to 105.0%. The results are presented in Table 1. Statistical comparation of the results with ICP AES method showed good agreement.

Table 1. Determination of Co(II) ions determination in babytea samples

Sample	Found by kinetc method (μg/ml)	RSD	(%)	Found by ICP AES (μg/ml)	Recovery (%)	F-test	t-test
T1	5.92±0.5	8.44	3.71	5.70±0.012	96.30	2.85	0.84
T2	0.21±0.005	2.40	4.54	0.22±0.004	95.45	1.43	1.36
T3	3.40±0.3	3.53	1.19	3.36±0.05	99.00	3.28	2.05
T4	4.57±0.06	1.31	6.02	4.31±0.102	94.31	2.16	1.74
T5	1.92±0.1	5.20	1.58	1.89±0.01	98.40	2.36	0.63
T6	3.51±0.01	4.00	0.28	3.52±0.05	99.71	1.58	1.95
T7	5.72±0.03	5.24	4.95	5.45 ±0.06	105.0	1.32	2.16
T8	0.092±0.002	2.17	6.12	0.098±0.003	93.87	3.56	1.07
T9	1.18±0.02	1.69	3.28	1.22±0.01	96.72	2.12	1.54
T10	1.94±0.02	1.03	1.57	1.91±0.05	101.57	1.74	1.87

Keywords: Co(II), kinetic method, baby tea samples

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