INVESTIGATION OF PD CATALYZED CO(III)-EDTA/HYPOPHOSPHITE INHIBITION REACTION KINETICS, MECHANISM AND THE EVALUATION OF ITS ANALYTICAL APLICATION POSSIBILITIES

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The reaction between Co(III)-EDTA and hypophosphite ion, catalyzed by Pd(II) was chosen as the indicator reaction. The inhibition kinetics of this catalytic reaction have been investigated by a mechanistic approach in the presence of some inhibitors. Catalysts other than PdCl₂, that is Pt, Au, Ni, salts, did not exhibit any effect on the reaction. An original reaction mechanism is proposed based on the experimental data. The important variables were optimised for maximum sensitivity. The calibration graph, which was prepared following the inhibition kinetic method, showed a linear relationship (r = -0.9878) between the initial rate and initial rate and iodide in the concentration range of 2 – 35 ng / cm³ I with detection limit of 1.2 ng / cm³ I (3S/m criterion). The RSDs of the method, (N=5) for 7 and 14 ng/ cm³ were 1.19 and 0.81 %, respectively, depended on iodide concentration. The method was only applied to the determination of in water, urin, iodized table salt and some drug samples and was compared with the modified Sandell-Kolthoff method.

References
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