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Spectrophotometric Determination of Oxalic Acid using Zirconium(IV)-(p-Acetylarsenazo) System

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A new spectrophotometric method for determination of oxalic acid has been developed. It is based on the property that in 0.40 mol L^{-1} HCl solution oxalic acid forms complexes with zirconium by replacing p-acetylarsenazo in zirconium-(p-acetylarsenazo) complex. The formed complex makes the absorbance of the solution increase. Over a specified range, the measured absorbance was proportional to the concentration of oxalic acid in the range of 3.0×10^{-5}–6.0×10^{-4} mol L^{-1}, according to Beer's law. The apparent molar absorptivity was $\varepsilon_{540\ nm} = 1.02 \times 10^3$ L mol^{-1} cm^{-1}. The detection limit of the method was 2.5×10^{-5} mol L^{-1}. The proposed method was satisfactorily applied to the determination of trace amount of oxalic acid in spinach and strawberry samples.