

甲醇-水二元混合物中Co(bpb)与叠氮离子反应的动力学研究

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摘要:

Co(bpb) [bpbH₂ is N,N'-o-phenylenebis(pyridine-2-carboxamide), C₁₈H₁₂N₄O₂] complex has active axial sites like a porphyrin complex. We studied the coordination of azide ion (N₃) to Co(bpb) in binary methanol-water mixtures by spectrophotometric method at the temperature range of 283-303 K. From the temperature dependence of the rate constant, activation parameters (E_a, ΔH[#], ΔS[#], and ΔG[#]) were obtained. An isokinetic temperature at about 302 K was observed at which the formation rate of Co(bpb)-N₃ was more or less independent of the solvent composition. The resulting ΔH against TΔS plot showed a good linear correlation, indicating the existence of enthalpy-entropy compensation in azide complexation process. Under optimum conditions and based on the absorbance of Co(bpb)-N₃ produced through complex formation, a spectrophotometric method for the determination of N₃ in solution was developed. A linear relationship between the absorbance and N₃ concentration was obtained in the range of (0.85-5.00)×10⁻⁴ mol·L⁻¹ (3.6-21.0 μg·mL⁻¹). The detection limit was 2.5×10⁻⁵ mol·L⁻¹ (1.0 μg·mL⁻¹). The proposed method was applied to the determination of N₃ anion in real water samples.

关键词: Spectrophotometric Kinetics Binary mixture Azide determination Water sample

收稿日期 2008-11-03 修回日期 2009-01-12 网络版发布日期 2009-03-03

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