

化学

氨基羟基脒与HNO₂氧化还原反应研究

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摘要 研究了高氯酸介质中氨基羟基脒与HNO₂的还原反应动力学, 其动力学方程式为 $-dc(\text{HNO}_2)/dt=kc(\text{HNO}_2)c^{0.25}(\text{HSC})c^{0.42}(\text{H}^+)$, 在1.0 °C时反应速率常数 $k=(1.05\pm 0.05) (\text{mol/L})^{-0.67}\cdot\text{s}^{-1}$, 活化能为 $(73.1\pm 3.0) \text{ kJ/mol}$ 。研究了氨基羟基脒浓度、H⁺浓度、硝酸根浓度对氨基羟基脒与HNO₂还原反应速率的影响。结果表明: 增加氨基羟基脒浓度和H⁺浓度, HNO₂还原速度增加; 高氯酸根浓度对氨基羟基脒还原HNO₂速率基本无影响。

关键词 [氨基羟基脒](#) [亚硝酸](#) [还原反应](#) [反应速率](#)

分类号

Kinetics of Reaction Between Hydroxysemicarbazide and HNO₂ in Perchloric Acid Solution

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Abstract The kinetics of reaction between HNO₂ and hydroxysemicarbazide in perchloric acid solution was studied. The rate equation is found to be $-dc(\text{HNO}_2)/dt=kc(\text{HNO}_2)c^{0.25}(\text{HSC})c^{0.42}(\text{H}^+)$, where $k=(1.05\pm 0.05) (\text{mol/L})^{-0.67}\cdot\text{s}^{-1}$ at 1.0 °C. The activation energy is found to be $(73.1\pm 3.0) \text{ kJ/mol}$. Effects of $c(\text{HSC})$, $c(\text{H}^+)$, ionic strength and temperature on reduction rate of HNO₂ were investigated. The results show that HNO₂ can be rapidly reduced by HSC under usual conditions. The reaction rate can be accelerated by increasing the concentration of HSC, acidity, ionic strength and reaction temperature. The influence of ClO₄⁻ on reaction rate is negligible.

Key words [hydroxysemicarbazide](#) [HNO₂](#) [reduction](#) [reaction](#) [reaction](#) [rate](#)

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