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钐(III)与不对称希夫碱配合物的合成、表征和热分解反应动力学

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摘要 L-赖氨酸与水杨醛、萘酚醛作用合成了一种不对称希夫碱配体 $C_{124}H_{23}O_4N_2Li$

(LLi)。在异丙醇和甲醇体系中硝酸钐与该配体反应合成了一种稀土希夫碱配合物 $[SmL(NO_3)]$

$NO_3 \cdot 2H_2O$ 。通过元素分析、IR、UV、TG-DTG及摩尔电导分析等手段对合成的配合物进行了表征,

用非等温热重法研究了钐(III)配合物的热分解反应动力学, 推断出第二步热分解的动力学方程为: da/dt

$=A \cdot e^{-E/RT} \cdot 3/2(1-\alpha)^{2/3} [1-(1-\alpha)^{1/3}]^{-1}$, 得到了动力学参数E和A。并计算出了活化熵 ΔS^\ddagger 和活化吉布斯自由能 ΔG^\ddagger 。

关键词 [不对称希夫碱, 钐\(III\)配合物, 热分解反应动力学](#)

分类号

Synthesis, Characterization and Thermodecomposition Kinetics of Sm(III) Complex with Unsymmetrical Schiff Base Zwitterion Ligand

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Abstract A new unsymmetrical Schiff base zwitterion (LLi) was synthesized using L-lysine, salicylaldehyde and 2-hydroxy-1-naphthaldehyde. Samarium(III) complex of this ligand $[SmL(NO_3)]NO_3 \cdot 2H_2O$ has been prepared and characterized by elemental analyses, IR, UV and molar conductance. The thermal decomposition kinetics of the complex for the second stage was studied under non-isothermal condition by TG and DTG methods. The kinetic equation may be expressed as $da/dt = 3/2Ae^{-E/RT}(1-\alpha)^{2/3}[1-(1-\alpha)^{1/3}]^{-1}$. The kinetic parameters (E , A), activation entropy ΔS^\ddagger and activation free-energy ΔG^\ddagger were also gained.

Key words [unsymmetrical Schiff base](#) [samarium\(III\) complex](#) [thermal decomposition](#) [non-isothermal kinetics](#)

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