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硝酸处理对 EDTA-柠檬酸联合络合法制备$La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$的影响

周嵬, 薛小平, 葛磊, 郑尧, 邵宗平, 金万勤

南京工业大学化学化工学院省部共建材料化学工程教育部重点实验室, 南京 210009

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摘要 在EDTA-柠檬酸联合络合法制备LSCF复合氧化物的过程中, 利用浓硝酸对LSCF的固态前驱体进行处理, 实现前驱体低温自燃烧反应. 以H_2O_2分解作为模型反应考察不同制备条件对催化性能的影响到响.
通过系统研究固态前驱体水溶液的pH值和固态前驱体的FT-IR结果, 对其分解过程进行了,
并解释了自燃发生的原因. 通过XRD考察了初级粉体经高温焙烧后产物的晶体结构. 研究结果表明:
硝酸处理可以抑制LSCF晶粒生长, 并且提高LSCF的双氧水催化性能, 其中LSCF-40-900的催化性能最好.

关键词 钙钛矿型氧化物 La0.6Sr0.4Co0.2Fe0.8O3-δ 硝酸处理 双氧水分解

分类号 TQ174

Effect of HNO_3 Treatment on the $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ Obtained via Combined EDTA-citrate Complexing Process

ZHOU Wei, XUE Xiao-Ping, GE Lei, ZHENG Yao, SHAO Zong-Ping, JIN Wan-Qin

Key Laboratory of Materials-Oriented Chemical Engineering of Ministry of Education of China, College of Chemistry and Chemical Engineering, Nanjing University of Technology, Nanjing 210009, China

Abstract The $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$(LSCF) composite oxide was prepared via combined EDTA-citrate complexing process with concentrated nitric acid treatment. The treatment would result in the self-combustion of solid state precursors at low temperatures. The effect of preparing conditions on LSCF's catalytic properties was investigated by using decomposition of peroxide hydrogen as the model. The FT-IR results of the solid state precursor and the pH values of aqueous solution of it were studied to determine the mechanism of the thermal decomposition of organic in the precursor and of the self-combustion process. Moreover, XRD was employed to characterize the crystal structure of LSCF calcined at higher temperatures. The study shows that the treatment can depress the growth of crystallite and improve the
catalysis for decomposition of peroxide hydrogen. Of the all samples, the LSCF-40-900 has the highest activity to the decomposition of peroxide hydrogen.

Key words perovskite-type oxide La0.6Sr0.4Co0.2Fe0.8O3-δ HNO3 treatment decomposition of peroxide hydrogen

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通讯作者 邵宗平 Shaozp@njut.edu.cn