燃料化学学报
JOURNAL OF FUEL CHEMISTRY AND TECHNOLOGY
ISSN 0253-2409
CN 14-1140/TQ

燃料化学学报 » 2012, Vol. 40 » Issue (12): 1409-1414 DOI:

Transformation of chlorine in NaCl-loaded Victorian brown coal during the gasification in steam

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全文: PDF (1 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 This study is to examine the changes in Cl volatilizations and chemical forms in NaCl-loaded Victorian brown coal during gasification in steam at 800 ℃ using Cl K-edge X-ray absorption near-edge structure (XANES) spectroscopy. The char samples were prepared in a novel one-stage fluidised-bed/fixed-bed quartz reactor at a fast heating rate. The samples were then collected and sealed in an argon-filled bag in order to minimise possible oxidation of char and Cl by air prior to analysis by XANES. Char-steam reactions were found to significantly affect the transformation of Cl, including the possible formation of chlorine-containing organic structures. On the other hand, volatile-char interactions during the gasification appeared to enhance the Cl retention and prevent the formation of organic chlorine compounds in chars.

关键词： chlorine gasification volatile-char interactions XANES

Abstract： This study is to examine the changes in Cl volatilizations and chemical forms in NaCl-loaded Victorian brown coal during gasification in steam at 800 ℃ using Cl K-edge X-ray absorption near-edge structure (XANES) spectroscopy. The char samples were prepared in a novel one-stage fluidised-bed/fixed-bed quartz reactor at a fast heating rate. The samples were then collected and sealed in an argon-filled bag in order to minimise possible oxidation of char and Cl by air prior to analysis by XANES. Char-steam reactions were found to significantly affect the transformation of Cl, including the possible formation of chlorine-containing organic structures. On the other hand, volatile-char interactions during the gasification appeared to enhance the Cl retention and prevent the formation of organic chlorine compounds in chars.

Key words： chlorine gasification volatile-char interactions XANES

收稿日期: 2012-08-28;

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引用本文:

ZHANG Shu,Mohammad Asadullah,Rosalie Hocking等. Transformation of chlorine in NaCl-loaded Victorian brown coal during the gasification in steam[J]. 燃料化学学报, 2012, 40(12): 1409-1414.

ZHANG Shu,Mohammad Asadullah,Rosalie Hocking et al. Transformation of chlorine in NaCl-loaded Victorian brown coal during the gasification in steam [J]. J Fuel Chem Technol, 2012, 40(12): 1409-1414.

链接本文:

http://rlhxxb.sxicc.ac.cn/CN/ 或 http://rlhxxb.sxicc.ac.cn/CN/Y2012/V40/I12/1409

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