

论文

金属载氧体的积碳特性研究

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摘要:

以CO为燃料(即还原性气氛), 在热天平上分别对Ni基、Fe基、Cu基和Co基4种制备金属载氧体进行热重实验, 通过分析各自的TG曲线, 了解到4种载氧体均出现了不同程度的积碳现象, 其中Cu基载氧体可以在一定程度上抑制积碳。为了避免因积碳而带来的载氧体失活, 在管式炉内进行CO和载氧体的燃烧反应时, 向炉内通入水蒸气, 发现CO还原金属载氧体时, 通入水蒸气可以有效地抑制积碳。最后利用X射线衍射仪(XRD)扫描反应产物, 分析结果显示, 通水蒸气时C的特征峰已经消失, 进一步验证了水蒸气的抑碳效果。

关键词: 载氧体; 积碳特性; 化学链燃烧; 水蒸气

Research on the carbon deposition characteristics of the metal oxygen carrier

Abstract:

TGA(Thermal Gravimetric Analysis) was used to research on Ni-based, Fe-based, Cu-based and Co-based prepared oxygen carriers, and the TG test curves reflect the carbon deposition characteristics of different prepared oxygen carriers and indicate that the Cu-based oxygen carrier can restrain carbon deposition to some extent. When combustion reaction of CO was conducted in the tube furnace, adopting the method of feeding water vapour into the furnace can avoid carbon deposition effectively. Finally, the XRD(X-Ray Diffraction) was used to scan the reaction product to evaluate the anti-carbon effect of the experiment. Compared with the no steam condition, it can be found that the characteristic peaks of carbon are disappeared on feeding steam condition, and carbon deposition controlled by the addition of steam is confirmed further.

Keywords: water vapour

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