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## 活性炭纤维负载氧化镧催化净化NO的实验研究

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英文关键词 [active carbon fiber](#) [La<sub>2</sub>O<sub>3</sub>](#) [NO](#) [catalyst](#) [purification](#)

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### 中文摘要

以ACF作为载体制备了负载不同质量分数La<sub>2</sub>O<sub>3</sub>的负载型催化剂,研究了它们催化净化NO的活性和活性的稳定性,同时对比研究了ACF、HNO<sub>3</sub>/ACF净化NO的能力.正交实验结果表明,实验中最佳的氧气体积分数为5%,最佳空速为5 000 m<sup>3</sup>·(m<sup>3</sup>·h)<sup>-1</sup>;催化实验结果表明,ACF的低温活性很差,HNO<sub>3</sub>/ACF净化NO的低温活性很好,但是其活性的稳定性很差;负载了La<sub>2</sub>O<sub>3</sub>的ACF能大幅提升ACF净化NO的能力,其活性中心为La<sub>2</sub>O<sub>3</sub>,La<sub>2</sub>O<sub>3</sub>的最佳负载量为20%,350℃以上时,20% La<sub>2</sub>O<sub>3</sub>/ACF催化净化NO的效率均在95%以上,在200℃恒温条件下,其催化活性约能持续8h;催化剂的理化特征实验结果表明,ACF、HNO<sub>3</sub>/ACF净化NO的机制与负载了La<sub>2</sub>O<sub>3</sub>的ACF净化NO的机制有着本质的区别.

### 英文摘要

The active carbon fiber(ACF) loaded different contents of La<sub>2</sub>O<sub>3</sub>catalysts were prepared, and their catalytic activities and durability for the purification of NO were investigated, and for comparison, those of ACF and HNO<sub>3</sub>/ACF for the title reaction were also investigated.The orthogonal experiment results showed that the best volume fraction of oxygen in the mixed gas was 5%, and the best air speed of mixed gas was 5 000 m<sup>3</sup>·(m<sup>3</sup>·h)<sup>-1</sup>.The catalytic experiment results showed that the activity of HNO<sub>3</sub>/ACF was better than that of ACF when the temperature was below 414.08℃, but the activity durability of HNO<sub>3</sub>/ACF was inferior than that of ACF. The activity and the activity durability of ACF could be markedly increased when it was loaded La<sub>2</sub>O<sub>3</sub>catalyst, the activity center of the catalyst was La<sub>2</sub>O<sub>3</sub>, and the La<sub>2</sub>O<sub>3</sub>catalyst best load amount was 20%, the activity of 20% La<sub>2</sub>O<sub>3</sub>/ACF would above 95% when the temperature was higher than 350℃, and its activity durability was about 8 h, which was superior than most of the catalysts that had been reported.The results of FT-IR and TG experiments also showed that the NO purification principle of ACF and HNO<sub>3</sub>/ACF was different from that of La<sub>2</sub>O<sub>3</sub>/ACF, when NO was purified by La<sub>2</sub>O<sub>3</sub>/ACF, the competition reactions took place between CO and NO.

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