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Review

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Adsorption/Reduction of Nitrogen Dioxide on Activated Carbons : Textural Properties versus Surface Chemistry - A Review

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Abstract

Activated carbons are promising materials for nitrogen dioxide adsorption. The synthesis, the characterization of activated carbons and their adsorption performance toward nitrogen dioxide are here reviewed. Particular attention is given to the synthesis methods and their effects on the textural, structural and surface chemistry properties of activated carbons. Then, the application for the removal of NO₂ and the related interaction mechanisms are discussed through a focus on the role of their porous texture and surface chemistry. From the available published data, the relation between the activated carbons performance and their physico-chemical properties has been presented. Furthermore, a mechanism including physisorption, reduction and chemisorption of NO₂ on activated carbons has been proposed.

Keywords : Nitrogen Dioxide, Activated Carbon, Surface Oxygen Groups, Micropores
volumes

1. Introduction

The increase of harmful substances emission into the atmosphere has become a serious environmental issue. Among the major threatening toxic gases, nitrogen oxides (NO_x) have negative effects through the smog and the acid rain formations, as well as the ozone layer decrease [1]. Moreover, NO_x react with other molecules (water vapour, ammonia, ...) leading

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