

# Effect of Activated Carbon Modification on the Performance of Adsorption Arsenic Removal Catalyst

Feng Qi<sup>1</sup>, Li Yang<sup>1, 2, \*</sup>, Jiang Zengkun<sup>1</sup>, Ge Shaohui<sup>1, 2</sup>, Ju Ya'na<sup>1</sup>, Zhang Yalin<sup>1</sup>

<sup>1</sup>Petrochemical Research Institute, China National Petroleum Corporation, Beijing, China

<sup>2</sup>Key Laboratory of Clean Fuel, China National Petroleum Corporation, Beijing, China

## Email address:

fengqi010@petrochina.com.cn (Feng Qi), liyang010@petrochina.com.cn (Li Yang),  
jiangzengkun@petrochina.com.cn (Jiang Zengkun), geshaohui@petrochina.com.cn (Ge Shaohui),  
juyana@petrochina.com.cn (Ju Ya'na), zhangyalin010@petrochina.com.cn (Zhang Yalin)

\*Corresponding author

## Abstract

The activated carbon (AC) was chemically modified by  $K_2CO_3$ , and the specific surface area, pore volume and pore size of the AC after modification were investigated. As the mass ratio of  $K_2CO_3$  to AC (alkali-carbon ratio) increased, the specific surface area of the modified AC shows a trend of increasing first and then decreasing. When the ratio of alkali to carbon was 6, the specific surface area of the modified AC increased from the initial  $653.3\text{m}^2/\text{g}$  to  $1333.6\text{m}^2/\text{g}$ . The modified AC was then used as the support to prepare an adsorption catalyst for arsenic removal, which exhibits excellent arsenic adsorption owing to the multi-level pore channels composed of micropore-mesopores. The micropore ensured the catalyst with a large specific surface area, so the active components can be efficiently dispersed on it, while the mesopore allowed the macromolecular arsenide to fully contact and react with the active metal components, and thus improved arsenic removal efficiency.

## Keywords

Activated Carbon, Modification by Potassium Carbonate ( $K_2CO_3$ ), Adsorption, Support, Catalyst