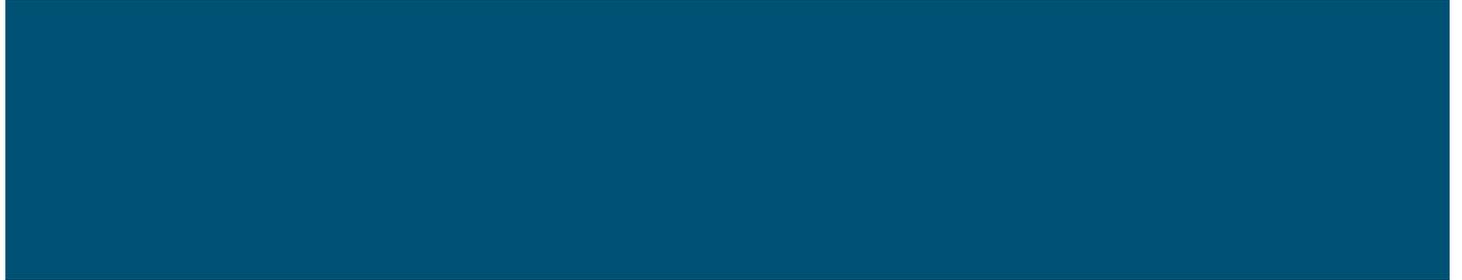


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## Effect of Halide Impregnation on Elemental Mercury Removal of Activated Carbons

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## Abstract

Activated carbons (ACs) were impregnated with potassium halides (KX) to enhance the removal efficiency of elemental mercury ( $\text{Hg}^0$ ). In this work, the impregnation effect of potassium bromide (KBr) and potassium iodine (KI) were investigated. The surface properties of KX-impregnated ACs were determined by scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS). The pore structures and total pore volumes of the KX-impregnated ACs were analyzed using the  $\text{N}_2$

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of KI and KBr adsorption isotherms. The  $Hg^0$  removal efficiency of KI and KBr impregnated activated carbons (ACs) and KI and KBr impregnated activated carbons (ACs) was studied under simulated flue gas conditions. The effects of KI and KBr loading, adsorption temperature, and flue gas components on  $Hg^0$  removal efficiency were also investigated. The results showed that the  $Hg^0$  removal efficiency of the ACs was significantly enhanced by KI or KBr impregnation, and KI impregnated ACs showed higher  $Hg^0$  removal efficiency than KBr impregnated ACs under the same conditions. An increase in KI or KBr loading and higher adsorption temperatures improved the  $Hg^0$  removal efficiency, indicating that chemisorption occurred due to the reaction between  $X^{f, A, A'}$  and  $Hg^0$ . The lower extent of  $Hg^0$  removal exhibited by the KBr impregnated ACs than by the KI impregnated ACs was due to the difficulty of  $B_2$  formation on the surfaces.

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- Peng Hu, Yufeng Duan, Weike Ding, Jun Zhang, Liyi Bai, Na Li and Hongqi Wei, Enhancement of Mercury Removal Efficiency by Activated Carbon Treated with Nonthermal Plasma in Different Atmospheres, *Energy & Fuels*, 10.1021/acs.energyfuels.7b01973, **31**, 12, (13852-13858), (2017).

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