Study on adsorption performance of coal based activated carbon to radioactive iodine and stable iodine

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Highlights

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The impregnated coal-based activated carbons as adsorbent for removing methyl iodide.

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The coal-based activated carbons to remove stable iodine.

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Iodine residues are under 0.5 μg/ml after adsorption treatment.

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The decontamination factor is much higher than 1000.

Abstract

Nuclear power plant, nuclear reactors and nuclear powered ship exhaust contains a large amount of gaseous radioactive iodine, and can damage to the workplace and the surrounding environment. The quantitative test to remove methyl iodide and the qualitative test for removing stable iodine were investigated using the impregnated coal-based activated carbons and coal-based activated carbons as adsorbents. The research conducted in this work shows that iodine residues were under 0.5 μg/ml after adsorption treatment and the decontamination factor of the coal-based activated carbon for removing the stable iodine was more than 1000, which can achieve the purpose of removing harmful iodine, and satisfy the requirement of gaseous waste treatment of nuclear powered vessel and other nuclear plants.

Keywords

* Nuclear powered vessel;
* Methyl iodide;
* Stable iodine;
* Adsorption;
* Activated carbon;
* Decontamination factors