

Mercury removal from aqueous solution and flue gas by adsorption on activated carbon fibres

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Abstract

The use of two activated carbon fibres, one laboratorial sample prepared from a commercial acrylic textile fibre and one commercial sample of

Kynol¹, as prepared/received and modified by reaction with powdered sulfur and H₂S gas in order to increase the sulfur content were studied for

the removal of mercury from aqueous solution and from flue gases from a fluidized bed combustor. The sulfur introduced ranged from 1 to 6 wt.%

depending on the method used. The most important parameter for the mercury uptake is the type of sulfur introduced rather than the total amount

and it was found that the H₂S treatment of ACF leads to samples with the highest mercury uptake, despite the lower sulfur amount introduced. The

modified samples by both methods can remove HgCl₂ from aqueous solutions at pH 6 within the range 290–710 mg/g (ACF) which can be

favourably compared with other studies already published. The use of a filter made with an activated carbon fibre modified by powdered sulfur

totally removed the mercury species present in the flue gases produced by combustion of fossil fuel.

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