Backwash Characteristics of Granualr Activated Carbon (GAC) from Asia

Introduction

GAC from Asia are offered on the European market, which are often cheaper compared to the US GACs, which are used mainly in the past. Besides the purity and the adsorption capacity of these carbons physical properties of GAC have to be considered.

Importance

In a research project before it was found that coal based GAC from Asia and from US differ in the parameter bulk density packed. Although the product specifications list similar values for the bulk density after backwashing, different values are found during the operation of a pilot plant. In a filter column the GAC from Asia is not that homogenous in bulk density after backwashing depending on the bed depth the carbon samples were taken. Such an impact of bed depth could not be observed for GAC from US, which are mainly applied in water utilities.

From this observation it is supposed that the distribution of density may have an impact on backwash characteristics. Data for the backwash behaviour are not available for all carbon types especially new ones and due to the similar average values for bulk density it is not in evidence that the backwash procedure has to be changed. Thus a loss of GAC during the first backwash cycle can not be excluded if US GAC is changed by Asia GAC. The backwash characteristics are investigated in this project for actual Asia GAC types.

Approach

Pilot studies are performed for six commercial Asia GAC and one US GAC to evaluate and compare the backwash characteristics of the activated carbons. The different GAC types were characterized by more parameters as bulk density, particle size distribution and adsorption capacity.

Result

The bulk density and adsorption capacity of coal based GAC types from Asia are more inhomogeneous within one carbon charge compared to US GAC. It can not be concluded that all GAC from Asia have the same backwash characteristics. Some Asia GACs behave similar to US GAC during backwashing, some differ significantly.

Thus the research project shows that the backwash regime has to be adjusted for all GAC types to avoid a carbon loss during the first backwash cycle and to assure an optimal placing into operation of the GAC adsorber.

More information

Full details on this deliverable can be found under D 5.3.10. further information can be requested from

Dr. Brigitte Haist-Gulde
Technologiezentrum Wasser Karlsruhe
haist@tzw.de
+49 721 9678 122