



Florian Gnos

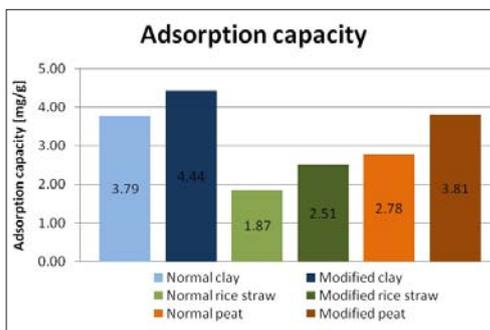
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Subject Area	Energy and Environmental Technology
Project Partner	East China University of Science and Technology

## Removal of PAH from Wastewater by CTAB-Modified Natural Material

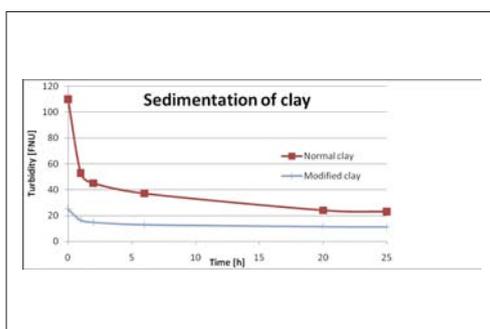
### 30 Wastewater treatment



Adsorbents



Influence of CTAB modification



Influence of CTAB modification

**Introduction:** Polycyclic Aromatic Hydrocarbons (PAH) are a class of pollutants which are mainly formed by the incomplete combustion of fossil fuels. These molecules are very common. However, some of them are highly carcinogenic. Rainfall transfers the PAH from the atmosphere into the water. Despite their low solubility in water, their accumulation over time can be a threat to plants, animals and humans. Pharmaceutical and Personal Care Products (PPCP) are another class of pollutants. Recent research on waters contaminated by PAH and PPCP have made scientists aware of the potential risks for society. At this time, wastewater treatment plants do not actively remove PAH. Activated carbon is a good adsorbent for PAH, but its high price is a major drawback. However, it is known that the surfactant CTAB can raise the adsorption capacity of different materials for various pollutants.

**Objective:** The objective of this work was to find an inexpensive material with a high adsorption capacity for PAH. Additionally it was necessary to investigate whether or not PAH and PPCP can be treated with this adsorbent. Furthermore, the effect of CTAB modification on adsorption capacity and on sedimentation had to be investigated.

**Result:** With CTAB modified clay, a low-cost material with a high adsorption capacity for PAH was found. Its adsorption capacity is even higher than that of activated carbon. It was shown that modification by CTAB increases the adsorption capacity for PAH for all tested adsorbents. In the case of clay, the modification even reduces the time of sedimentation. However, it is not possible to treat PAH and PPCP together with the same adsorbent. The price of modified clay is expected to be about 3 times lower than the price of activated carbon, which indicates good potential for further research on this topic.