Removal of phenol and chlorine from wastewater using steam activated biomass soot and tire carbon black

This study aims to demonstrate a novel method for removing toxic chemicals using soot produced from wood and herbaceous biomass pyrolyzed in a drop tube reactor and tire pyrolytic carbon black. The influence of ash content, nanostructure, particle size, and porosity on the filter efficiency of steam activated carbon materials was studied. It has been shown for the first time that steam activated soot and carbon black can remove phenol and chloride with filter efficiencies as high as 95%. The correlation of filter efficiency to material properties showed that the presence of alkali and steam activation time were the key parameters affecting filter efficiencies. This study shows that steam activated biomass soot and tire carbon black are promising alternatives for the cleaning of wastewater.