



## **Hemp stem-derived activated carbon for tar and nicotine adsorption in cigarette filter**

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Several chemicals in cigarette smoke are harmful, especially tar and nicotine as particulate matters from burning cigarette that increase the risk of lung diseases to the smokers and non-smokers nearby. This work aims to develop the carbon-incorporated cigarette filter that can effectively reduce nicotine and tar from the cigarette smoke. Hemp is the *Cannabis sativa* species as new industrial plant in Thailand with the limitation application only in textile industries. In this work, activated carbon was derived from hemp stem using chemical activation with phosphoric acid and activated carbon product was filled into the filter as an additive. The effects of activation temperature, impregnation ratio and the surface chemistry on hemp stem-derived activated carbon were studied. The surface area, porosity and the surface chemistry were analyzed. It is expected that the presence of oxygen functionalities on carbon surface can increase the adsorption ability.

**Keywords:** Hemp; Activated carbon; Cigarette filter; Nicotine and tar