Hydrogen storage capacities and pore textures of activated carbon fibers modified with fluorination

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In order to enhance hydrogen storage capacity, nanoporous activated carbon fibers were modified with fluorine gas. Surface functional groups were investigated by X-ray photoelectron spectroscopy (XPS) and Boehm method before/after fluorination. Pore structure of activated carbon fibers were measured by nitrogen adsorption isotherm at 77 K. Specific surface area and micropore size distribution were calculated by BET method and H-K method respectively. Hydrogen adsorption isotherms were studied at 77 K and 1 bar The BET specific surface area and micropore volume were decreased as increasing partial pressure of fluorine gas. O1s peaks were increasing and observed F1s peak after fluorination but the change as partial pressure of fluorine gas wasn't observed by X-ray photoelectron spectroscopy.