

Surface Treatment of Activated Carbon Materials for Hydrogen Storage

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Activated carbon materials, such as activated carbon (AC) and activated carbon fibers (ACFs) with high surface area and pore volume were modified by metal doping and fluorination and investigated hydrogen storage properties by volumetric method. We obtained that the micropore areas on AC and ACFs were considerably increased with Ni doping and hydrogen storage capacities were similarly increased. It could be confirmed that porous structure plays an important to determining the amounts of hydrogen adsorbed, compared with other Ni-doped carbon materials. But after fluorination treatment, although the micropore areas of AC and ACF were decreased, their amounts of hydrogen storage were found to be much higher than those measured in the same conditions without fluorination. These results indicated that surface of AC and ACFs after fluorination treatment may be strongly attracted hydrogen due to high electronegativity of fluorine. Hence, it was proven that hydrogen storage capacity was related with micropore areas and surface properties of carbon materials as well as surface areas.