Water-Soluble Active Carbon

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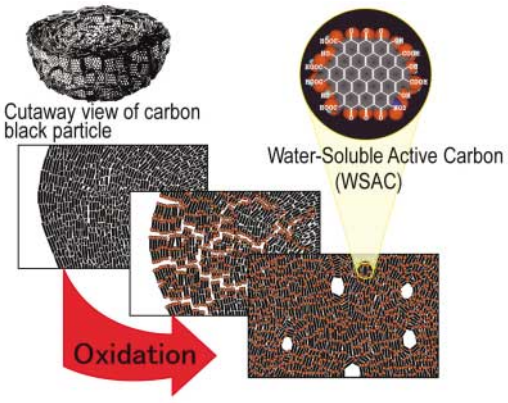
Water-soluble Active Carbons (WSACs) were yielded by oxidative degradation of carbon black particles. WSACs consist of hydrophobic polynuclear aromatic planes and many hydrophilic functional groups. They dissolve in neutral and alkaline aqueous solutions and capture organic compound molecules on their hydrophobic planes. The amounts of the organic compounds captured by the WSACs are roughly equal to those of activated carbons. Moreover, it was found that WSACs reduce the toxicity of the pesticide, TPN, by capturing the pesticide molecules. This material would be a promising candidate for an environment restorative material.



Schematic representation of formation of Water-Soluble Active Carbon from carbon black

Energy Science & Technology

Chemical Hydrogen Carrier

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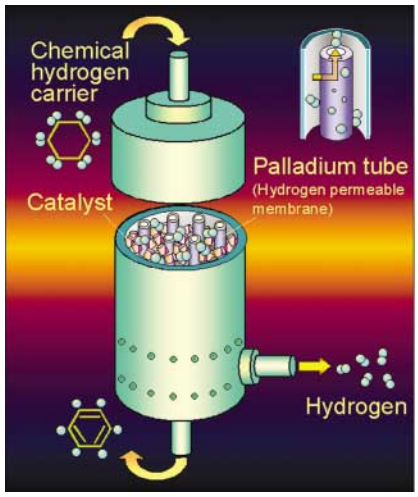
There has been a great concern on hydrogen as a clean secondary energy for fuel-cell driven cars etc. To the gas station, hydrogen should be transported in safety. For this purpose, liquid chemical carriers such as cyclohexane, dekalin, methyl cyclohexane, methanol etc. are promising candidates for hydrogen storage & transmission because those are liquid at an ordinary temperature and have higher hydrogen content (ca. 7 wt%). We have demonstrated that a highly efficient hydrogen production is possible using a palladium membrane reactor, where a hydrogen recovery exceeding 90% is obtained.



Recovery of pure hydrogen from chemical hydrogen carrier using a membrane reactor