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Adsorption and Physical Properties of Ar on carbon nanotubes
JEONGGIL LEE, EUIKWOUN KIM, JAE-YONG KIM, Department of Physics, Hanyang University, Seoul, Korea — Many interesting research results on carbon nanotubes (CNTs) have been reported focusing on their unique mechanical, electrical, physical properties and potential application for hydrogen storage, purification, and gas separation. Among physical properties, Ar gas adsorption study is known to provide useful information in investigate the surface structure and specific surface area of CNTs. Ar adsorption isotherms data were measured below the triple point (83.78K) by using an automatic isotherm apparatus. The amount of adsorbed Ar gas measured as a function of a final equilibrium vapor pressure enabled us to estimate specific surface area of CNTs, and the results were approximately in an order of 100 m^2/g. The isotherm adsorption results showed the formation of two atomic layers on the CNT surface at 65 and 70K. The broader shape of the isotherm step for the second isotherm step was observed. This observation suggests the irregular shape of the sample. The existence of the second isotherm step was supported by the calculations of the 2-dimenstional compressibility and the isosteric heat of adsorption values, and the results will be presented.

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