

Experimental Investigation on Activated Carbon Based Cryosorption Pump

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Abstract : Cryosorption pumps are considered to be safe, quiet and ultra-high vacuum production pumps which have their application from Semiconductor industries to ITER [International Thermonuclear Experimental Reactor] units. The principle of physisorption of gases over highly porous materials like activated charcoal at cryogenic temperatures (below -1500°C) is involved in determining the pumping speed of gases like Helium, Hydrogen, Argon and Nitrogen. This paper aims at providing detailed overview of development of Cryosorption pump which is the modern ultra-high vacuum pump and characterization of different activated charcoal materials that optimizes the performance of the pump. Different grades of charcoal were tested in order to determine the pumping speed of the pump and were compared with commercially available Varian cryopanel. The results for bare panel, bare panel with adhesive, cryopanel with pellets, and cryopanel with granules were obtained and compared. The comparison showed that cryopanel adhered with small granules gave better pumping speeds than large sized pellets.

Keywords : adhesive, cryopanel, granules, pellets

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