

Methane Adsorption on Phenol Resin Based Carbon Monolith

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The natural gas is the best alternative for liquid fluids in various points of view. The major constituent in natural gas is methane and therefore methane storage on various adsorbents was assessed on volume basis for the better design of adsorbed natural gas (ANG) storage system. The methane storage capacity on powder and granular type adsorbents is very low in volume basis due to their low packing densities. In this study, the density of powdered type phenol resin based adsorbent was increased by making monoliths to overcome this problem. Binders such as polyvinyl alcohol (PVA) and polyvinyl pyrrolidone (PVP) were used for this monolith preparation. The optimum conditions such as adsorbent quantity and binder's quantities, applied pressure were analyzed and monolith prepared based on the optimum conditions. Finally, methane storage capability of monolith was studied at various constant temperatures (303.15, 313.15 and 323.15) K under pressures up to 35 atm. The result showed the increment of methane storage in volume basis by these monolith type adsorbents.