ABSTRACT

Development of Adsorption Based Natural Gas Storage Process

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Gas storage is principally used to meet load variations for efficient use of natural gas (NG). Gas is injected into storage during periods of low demand and withdrawn from the storage during periods of peak demand. It is also used for a variety of secondary purposes such as balancing the flow in pipeline systems, market speculations, reducing price volatility, etc.

The most important type of gas storage is underground reservoirs. Three principal types of underground reservoirs are used; depleted gas reservoirs, aquifer reservoirs and salt cavern reservoirs. Each of these types has distinct physical and economic characteristics. However, they are generally use long term storage.

The presentation will be on the development adsorption based NG storage process for short term storage for daily (diurnal), weekly and seasonal demand swing. Adsorbed natural gas storage has the advantages in terms of its operating simplicity, design flexibility, low energy requirements and reduced environmental impact. It can easily be built in different size, shape and place according to need. It can also be integrated with the existing gas pipeline to accommodate the daily demand swing.

The viability of adsorption based NG storage process depends of the cost and stability of adsorbent material. Currently activated carbon is the most promising one. Metallic Organic Frameworks (MOF) and zeolite type adsorbents, which are the other alternatives, are still in the development stage.

Development of NG storage process from lab to demo scale with experimental data will be discussed, which will also include the synthesis of novel activated carbon (zeolite templated carbon).