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Potential of shale gas in Indian sedimentary basin

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Shale gas is natural gas produced from carbonaceous shale formations that typically function as both the reservoir and source rocks for the natural gas. Shale gas is typically a dry gas composed primarily of methane, but some formations do produce wet gas. Carbonaceous shales are organic-rich shale formations that were previously regarded only as source rocks and seals for gas accumulating in the strata near sandstone and carbonate reservoirs of traditional onshore gas development. In India, there are 28 sedimentary basins and some of the basins are rich with carbonaceous shales. We have carried out in Vindhyan basin, Damodar basin, Spiti-Zanskar basin, Cambay basin, Saurashtra basin and Kutch basin. Based on our data shales in Vindhyan, Damodar, Cambay, Saurashtra and Kutch basin are good source of shale gas. Based on our organic geochemical data, coring is to be carried out to study the core for their petrography, mineralogy, geochemistry and potential of shale gas.

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Investigation of optimal sweetening processes for natural gas

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Natural gas generally contains a large amount of methane along heavier hydrocarbons such as ethane, propane, normal butane and butane. Also in the raw state it often contains non hydrocarbons, such as nitrogen and acid gases (carbon with dioxide-hydrogen disulphide). The acid gases must be removed from natural gas before use. This paper discussed the design of four units to remove acid gases from natural gas to achieve sales gas specifications. The first method depends on chemical absorption by using DEA solvent. The extraction of hydrocarbon by this method was high. This solvent is very expensive and required high energy to recycle it again. The second method used K2CO3 which is a less expensive chemical solution than DEA solvent. This solution cannot achieve sales gas specifications but reducing the amount of acid gases in natural gas and then DEA is used to achieve sales gas specification. The design calculated the amount of solvent needed for the first and second methods and it was found that it required high amount of solvent, thus another physical method was thought about. The most widely used method is the membrane which is divided to two stages. The first stage recovery of hydrocarbon is 90.2% and the second stage recovery is 97.5%. The membrane technology doesn't achieve sales gas specifications but is useful in reducing acid gases when present in high percentage. Besides, a high energy requirement for gas compression is needed. Thus, it is suggested to reduce amount of acid gases by a chemical solutions of K_2CO_3 followed by the use of a membrane to achieve sales gas specifications. The choice of the recommended process depends on economic study for the four units. In addition, a simulation study for the design of an industrial gas sweetening plant has been done for the four units. This is followed by an economic study for the four units to reach the best economical method for sweetening natural gas. The study showed that the best economical method is the use of hot potassium carbonate and membrane unit.

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