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The effect of operational temperature and some design parameters in natural gas purification unit by using Aspen HYSYS simulation

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ABSTRACT

More recently, the demand for energy has increased to meet the growing need for it because of the continuous development in all areas of life. The importance of the subject must be achieved by focusing on the sources of this energy, including the energy produced by natural gas, which has increased interest in manufacturing in recent years, which is a clean source of energy compared to the energy produced from crude oil, for example, we find that Libya came in the center The eighth in the Arab reserves of 1.5 trillion cubic meters, according to data from the OAPPEC, the reserves of OPEC countries of proven natural gas represents 27% of the global reserve. The natural gas industry is considered one of the most important oil industries. The industry is undergoing several stages, the most important of which is the phase of removing H₂S gas and CO₂ from natural gas components due to problems such as environmental pollution and corrosion of operating equipment. The aim of this study is to increase the concentration of CH₄ and natural gas purification by Diethanolamine (DEA) from these pollutants, which were discussed in this study using the Aspen HYSYS program to simulate the steady state of typical natural gas composition of this phase by changing several parameters Design and operation such as operating temperature, gas flow rate, diameter and number of trays for absorption column. In order to achieve the best results of the degree of purity of methane after the purification phase where a rate of about 1245 kgmole/h (25 MMSCFD) reached a purity of 93% for methane and the number of trays 20, including a space of 0.5 m.

Keywords. Aspen Hysys,Tray Spacing, Gas flow rate.