Process Simulation of CO_2 Injection System Using Reciprocating Compressors for CO_2 Enhanced Oil Recovery

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Enhanced oil recovery (EOR) is an effort to recover remaining oils in the old or less-productive reservoir. One of the most well known techniques is CO2 injection. In this method, CO2 is injected into the reservoir at certain pressure to push the oil out. The pressure required for the process varies according to the reservoir condition. To make sure the CO2 is transferred well into the reservoir, it is necessary to have a good and reliable injection system.
Reciprocating compressor is a positive displacement machine which works by the principle of reducing the volume of fluids in a cylinder which compresses it by the movements of a piston. It has a wider pressure and capacity range than centrifugal compressor which makes reciprocating compressor more suitable for a pilot project with lower flow rate. Reciprocating compressor also has high pressure ratio which leads to less compression stage required and simpler mechanical complexity. This study will present a deeper look on the behavior of CO2 injection system using reciprocating compressors by using a process simulator.