

Optimal-engineering CO₂ Pipeline Design and CCS Transport Network System Modeling

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At the moment, CO₂ pipelines are designed using existing national standard for gas and liquid transportation pipelines. But the properties of CO₂ are considerably different from other fluids commonly transported by pipeline, such as natural gas. So it is necessary to use accurate representations of the phase behavior, density, and viscosity of CO₂ and CO₂ containing mixtures in the design of the pipeline.

The research presented here based on the physical properties of CO₂ and CO₂ containing mixtures calculated. The cost of a pipeline is estimated to determine the diameter, length and allowed pressure drop for a given mass flow rate of CO₂. Once these parameters are defined, then total cost for the pipeline can be estimated. We use the study which used advanced pipeline modeling to estimate the diameters of CO₂ pipelines. And then, we use an approach to estimate several components of the total cost of a CO₂ pipeline. Objective of this research is to find the optimal management of CCS transport pipeline network system. This research propose the optimal engineering CO₂ pipeline design and CCS pipeline network design for transporting CO₂ which based on graph theory.