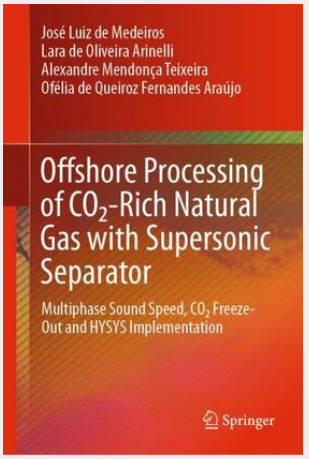
de Medeiros / Araújo / de Oliveira Arinelli

Offshore Processing of CO2-Rich Natural Gas with Supersonic Separator

Multiphase Sound Speed, CO2 Freeze-Out and HYSYS Implementation

This book introduces a new and powerful approach based on rigorous process simulations conducted with professional simulators like HYSYS to predict the performance of supersonic separators (SS). The book addresses the utilization of SSs for the offshore processing of CO2-rich natural gas as an alternative to Joule-Thomson expansion, glycol absorption, membrane permeation and chemical absorption. It describes and analyzes the conventional offshore processing of CO2-rich natural gas, discussing the advantages of SS in terms of cost and power consumption. The book offers a comprehensive framework for modeling SS units, describing the physical principles of SS in detail. The thermodynamic multiphase sound speed is also discussed at the light shed by a classical analysis based on the Landau Model of phase transitions. A complete framework is presented for modelling and simulating SS units within HYSYS environment. A special chapter is dedicated to the performance of SSs for removing CO2 from CO2-rich natural gas, taking into account the limitations of CO2 freeze-out in various scenarios of gas feed in terms of CO2 content, pressure and temperature.



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