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ConocoPhillips E-Gas Gasifier; Shell Gasifier; Siemens Gasifier; Mitsubishi Heavy Industries (MHI) Gasifier; Pratt and Whitney Rocketdyne (PWR) Gasifier; Less Conventional Gasifiers: The Alter NRG Plasma Gasification System; References; Chapter 5 Underground Coal Gasification; Underground Gasification Concept; Motivation; Connections between Injection and Production Wells; Process Control and Modeling; Water Contamination; UCG-recoverable Coal; GasTech Process and Economic Study; References; Chapter 6 Sulfur Recovery Coal CombustionSulfur Compounds in Syngas; COS Hydrolysis; Water Quench/Water Condensation; Acid Gas Removal Processes; Physical Solvent: Rectisol Process; Physical Solvent: Selexol; Chemical Solvents: Amines; Chemical Solvents: Benfield Process; Chemical Solvents: Aqueous Ammonia; Solid Adsorbents for Sulfur Removal; Elemental Sulfur: Claus Process; Shell Claus Offgas Treatment (SCOT) Process; Sulfuric and Phosphoric Acid; Co-sequestration of CO2 and H2S; References; Chapter 7 Hydrogen Production and Integrated Gasification Combined Cycle (IGCC); Need for Increasing H2 Content
Water Gas Shift in the Catalytic Temperature RangeHydrogen for Ammonia Synthesis; Iron-Based HT Shift Catalyst; LT Shift Catalyst; Sour Gas Shift; Steam-Iron Process; Hydrogen for Ammonia Synthesis: Removal of Residual Impurities; Dehydration; Hydrogen for Proton Exchange Membrane Fuel Cells; Hydrogen for Petroleum Refining; Combined cycle plants for power production, NGCC, and IGCC; Natural Gas Combined Cycle (NGCC); Integrated Gasification Combined Cycle (IGCC); Combining IGCC and Oxy-Combustion; Methanol, SNG, and Fischer-Tropsch Synthesis; References
Chapter 8 Hydrogen Adsorption and Storage

Sommario/riassunto

Skyrocketing energy costs have spurred renewed interest in coal gasification. Currently available information on this subject needs to be updated, however, and focused on specific coals and end products. For example, carbon capture and sequestration, previously given little attention, now has a prominent role in coal conversion processes.This book approaches coal gasification and related technologies from a process engineering point of view, with topics chosen to aid the process engineer who is interested in a complete, coal-to-products system. It provides a perspective for engineers a