1. Record Nr. UNINA9910139987303321

Titolo	Hydrogen and syngas production and purification technologies / / edited by Ke Liu, Chunshan Song, Velu Subramani
Pubbl/distr/stampa	Hoboken, NJ, : Wiley, c2010
ISBN	9786612455285 9781282455283 1282455281 9780470561256 0470561254 9780470561249 0470561246
Edizione	[1st ed.]
Descrizione fisica	1 online resource (564 p.)
Classificazione	ZP 4150 VN 5000
Altri autori (Persone)	LiuKe <1964-> SongChunshan SubramaniVelu <1965->
Disciplina	662.6 665.8/1
Soggetti	Hydrogen as fuel Synthesis gas Coal gasification
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Hydrogen and Syngas Production and Purification Technologies; Contents; Preface; Contributors; 1. Introduction to Hydrogen and Syngas Production and Purification Technologies; 1.1 Importance of Hydrogen and Syngas Production; 1.2 Principles of Syngas and Hydrogen Production; 1.3 Options for Hydrogen and Syngas Production; 1.4 Hydrogen Energy and Fuel Cells; 1.5 Fuel Processing for Fuel Cells; 1.6 Sulfur Removal; 1.7 CO(2) Capture and Separation; 1.8 Scope of the Book; Acknowledgments; References; 2. Catalytic Steam Reforming Technology for the Production of Hydrogen and Syngas 2.1 Introduction 2.2 Steam Reforming of Light Hydrocarbons; 2.2.1

Steam Reforming of Natural Gas; 2.2.2 Steam Reforming of C(2)-C(4) Hydrocarbons; 2.3 Steam Reforming of Liquid Hydrocarbons; 2.3.1 Chemistry; 2.3.2 Thermodynamics; 2.3.3 Catalyst; 2.3.4 Kinetics; 2.3.5 Mechanism; 2.3.6 Prereforming; 2.4 Steam Reforming of Alcohols; 2.4.1 Steam Reforming of Methanol (SRM); 2.4.2 Steam Reforming of Ethanol (SRE); 2.5 Carbon Formation and Catalyst Deactivation; 2.6 Recent Developments in Reforming Technologies; 2.6.1 Microreactor Reformer; 2.6.2 Plate Reformer; 2.6.3 Membrane Reformer
2.6.4 Plasma Reforming (PR) 2.7 Summary; References; 3. Catalytic Partial Oxidation and Autothermal Reforming; 3.1 Introduction; 3.2 Natural Gas Reforming Technologies: Fundamental Chemistry; 3.2.1 ATR; 3.2.2 Homogeneous POX; 3.2.3 CPO; 3.3 Development/Commercialization Status of ATR, POX, and CPO Reformers; 3.4 CPO Catalysts; 3.4.1 Nickel-Based CPO Catalysts; 3.4.2 Precious Metal CPO Catalysts; 3.5 CPO Mechanism and Kinetics; 3.5.1 Ni Catalyst Mechanism and Reactor Kinetics Modeling; 3.5.2 Precious Metal Catalyst Mechanism and Reactor Kinetics Modeling
3.6 Start-Up and Shutdown Procedure of CPO 3.7 CPO of Renewable Fuels; 3.8 Summary; Acknowledgments; References; 4. Coal Gasification; 4.1 Introduction to Gasification; 4.2 Coal Gasification History; 4.3 Coal Gasification Chemistry; 4.3.1 Pyrolysis Process; 4.3.2 Combustion of Volatiles; 4.3.3 Char Gasification Reactions; 4.3.4 Ash-Slag Chemistry; 4.4 Gasification Thermodynamics; 4.5 Gasification Kinetics; 4.5.1 Reaction Mechanisms and the Kinetics of the Boudouard Reaction; 4.5.2 Reaction Mechanisms and the Kinetics of the Water-Gas Reaction; 4.6 Classification of Different Gasifiers
4.7 GE (Texaco) Gasification Technology with CWS Feeding 4.7.1 Introduction to GE Gasification Technology; 4.7.2 GE Gasification Process; 4.7.3 Coal Requirements of the GE Gasifier; 4.7.4 Summary of GE Slurry Feeding Gasification Technology; 4.8 Shell Gasification Technology with Dry Feeding; 4.8.1 Introduction to Dry-Feeding Coal Gasification; 4.8.2 Shell Gasification Process; 4.8.3 Coal Requirements of Shell Gasification Process; 4.8.4 Summary of Dry-Feeding Shell Gasifier; 4.9 Other Gasification Technologies; 4.9.1 GSP Gasification Technology
4.9.2 East China University of Science and Technology (ECUST) Gasifier

Sommario/riassunto

Covers the timely topic of fuel cells and hydrogen-based energy from its fundamentals to practical applicationsServes as a resource for practicing researchers and as a text in graduate-level programsTackles crucial aspects in light of the new directions in the energy industry, in particular how to integrate fuel processing into contemporary systems like nuclear and gas power plantsIncludes homework-style problems