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Autore	Godula-Jopek Agata
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Nota di contenuto	Hydrogen Storage Technologies: New Materials, Transport, and Infrastructure; Contents; Preface; 1: Introduction; 1.1: History/Background; 1.2: Tanks and Storage; 2: Hydrogen - Fundamentals; 2.1: Hydrogen Phase Diagram; 2.2: Hydrogen in Comparison with Other Fuels; 2.3: Hydrogen Production; 2.3.1: Reforming Processes in Combination with Fossil Fuels (Coal, Natural Gas, and Mineral Oil); 2.3.1.1: Steam Reforming of Natural Gas; 2.3.1.2: Partial Oxidation and Autothermal Reforming of Hydrocarbons; 2.3.1.3: HyPr-RING Method to Produce Hydrogen from Hydrocarbons 2.3.1.4: Plasma-Assisted Production of Hydrogen from Hydrocarbons 3.1.5: Coal Gasification; 2.3.2: Water-Splitting Processes (Hydrogen from Water); 2.3.2.1: Electrolysis of Water with Electricity from Renewable and Nonrenewable Energy Sources (Low-Temperature Water Splitting); 2.3.2.2: Different Types of Electrolyzers; 2.3.2.3: High- Temperature Water Splitting in Combination with High-Temperature Nuclear Energy and Solar Energy; 2.3.3: Hydrogen from Biomass; 2.3.3.1: Thermochemical Processes; 2.3.3.2: Biological Processes;

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	2.3.4: Hydrogen from Aluminum; 2.3.5: Outlook
	 2.4: Hydrogen Storage Safety Aspects2.4.1: Hydrogen Properties Related to Safety; 2.4.2: Selected Incidents with Hydrogen; 2.4.3: Human Health Impact; 2.4.4: Sensors; 2.4.5: Regulations, Codes, and Standards (RCS); 2.4.6: Safety Aspects in the Hydrogen Chain from Production to the User; 2.4.6.1: Hydrogen Production; 2.4.6.2: Hydrogen Refuelling Stations; 2.4.6.3: Storage/Transportation (Compressed/Liquid/Metal Hydride); 2.4.6.4: Garage for Repairing Cars; 2.4.7: Safety Aspects of Hydrogen Vehicles; 2.4.8: Safe Removal of Hydrogen; References 3: Hydrogen Application: Infrastructural Requirements3.1: Transportation; 3.2: Filling Stations; 3.3: Distribution; 3.4: Military; 3.5: Portables; 3.6: Infrastructure Requirements; References; Further Reading; 4: Storage of Pure Hydrogen in Different States; 4.1: Purification of Hydrogen; 4.2: Compressed Hydrogen; 4.2.1: Properties; 4.2.2: Compression; 4.2.2.1: Mechanical Compressors; 4.2.2.2: Nonmechanical Compressor; 4.2.3: Materials; 4.2.3.1: Hydrogen Embrittlement; 4.2.3.2: Hydrogen Attack; 4.2.3.3: Hydrogen Permeation; 4.2.3.4: Used Structural Materials 4.2.3.5: Used Materials for Sealing and Liners4.2.3.6: High Pressure Metal Hydride Storage Tank; 4.2.4: Sensors, Instrumentation; 4.2.5: Tank Filling; 4.2.6: Applications; 4.2.6.1: Storage in Underground; 4.2.6.2: Road and Rail Transportation; 4.2.6.3: Vehicles; 4.3: Liquid/Slush Hydrogen; 4.3.1: Properties; 4.3.2: Ortho Para Conversion; 4.3.3: Liquefaction; 4.3.3.1: Linde Process; 4.3.3.2: Claude Process; 4.3.3.3: Collins Process; 4.3.3.4: Joule-Brayton Cycle; 4.3.3.5: Magnetic Liquefaction; 4.3.3.6: Thermoacoustic Liquefaction; 4.3.4: Hydrogen Slush; 4.3.5: Boil-Off 4.3.5.1: Zero Boil-Off Solutions
Sommario/riassunto	An exploration of current and possible future hydrogen storage technologies, written from an industrial perspective. The book describes the fundamentals, taking into consideration environmental, economic and safety aspects, as well as presenting infrastructure requirements, with a special focus on hydrogen applications in production, transportation, military, stationary and mobile storage.A comparison of the different storage technologies is also included, ranging from storage of pure hydrogen in different states, via chemicalstorage right up to new materials already under developm