

1. Record Nr.	UNINA9910877123903321
Autore	Barclay Frederick J
Titolo	Fuel cells, engines, and hydrogen : an exergy approach // Frederick J. Barclay
Pubbl/distr/stampa	Chichester, England ; ; Hoboken, NJ, : John Wiley & Sons, c2006
ISBN	0-470-03026-7 1-280-51895-2 9786610518951 1-60119-505-2 0-470-03025-9
Descrizione fisica	1 online resource (202 p.)
Disciplina	621.31/2429
Soggetti	Fuel cells Hydrogen as fuel
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. [177]-184) and index.
Nota di contenuto	Fuel Cells, Engines and Hydrogen; Contents; Foreword; Introduction, and Commentary on Matters Affecting all Chapters; 1 Altered Perspectives; 1.1 Power Storage; 1.2 Circulators; 1.3 Incompleteness; 1.4 The Hydrogen Mine; 1.5 Coal Gasification; 1.6 SOFCs; 1.7 MCFCs; 1.8 The PEFC; 1.9 Engines; 2 Regenerative Fuel Cells or Redox Flow Batteries; 2.1 Introduction to the Regenesys System; 2.2 History and Patents; 2.3 Regenesys Technologies Ltd; Power Storage; 2.4 Elementary Chemistry; 2.5 Modus Operandi of Regenesys; 2.6 Some Construction Details; 2.7 Ion and Electron Transfer 2.8 Power Storage Applications 2.9 Initial Operating Experience; 2.10 Electrical Equipment; 2.11 Remarks; 2.12 Conclusions; 3 Irreversible Thermodynamics; 3.1 Cells and Electrolysers with and without Circulators; 3.2 Irreversibility - An Introduction via Joule's Experiment; 3.3 PEFC Irreversibility; 3.4 Bacon's Fuel Cell; Avoidance of Irreversibility; 3.5 Fuel Cell Engineering; 3.6 Irreversibility in Calculation Routes; 3.7 Juggling with Irreversibilities; 3.8 Air-Breathing Fuel Cells - Irreversibilities 3.9 Liquid Electrolytes at the Electrode, 'Ice' Films, Marangoni Forces

and Diffusion Irreversibilities  
3.10 Overvoltage - An Electrical Irreversibility; 3.11 Biconductor Layers at the Electrode/Electrolyte Interface; 3.12 IR Drop; 3.13 Remarks; 4 Solid Oxide Fuel Cells (SOFCs); 4.1 Introduction; 4.1.1 The SOFC; 4.1.2 Electrolytes; 4.1.3 Electrolyte Thickness; 4.1.4 Cell Performance; 4.1.5 Competitive Cells; 4.1.6 Oxygen Ion Concentration; 4.1.7 Unused Fuel; 4.1.8 SOFC Internal Process; 4.1.9 SOFC Preheating for Start-Up; 4.1.10 SOFC Manoeuvrability; 4.1.11 Direct Hydrocarbon Oxidation  
4.2 Siemens Westinghouse  
4.2.1 Siemens - SOFC Integration with Gas Turbines; 4.3 Rolls-Royce; 4.4 NGK Insulators; 4.5 Mitsubishi Materials Corporation (MMTL); 4.6 Imperial College London and Ceres Power Ltd; 4.7 Ceramic Fuel Cells Ltd, Australia; 4.8 Forschungs Zentrum Julich (FZJ); 4.9 Global Thermoelectric; 4.10 Allied Signal; 4.11 Acumentrics; 4.12 Adelan; 4.13 Sulzer Hexis; 4.14 ECN/INDEC Petten, the Netherlands; 4.15 Remarks; 5 Molten Carbonate Fuel Cells (MCFCs); 5.1 Introduction to the MCFC; 5.1.1 MCFCs of FCE and MTU; 5.1.2 Detailed Fuel Cell Description; 5.1.3 Matrix Initiation  
5.1.4 Matrix and Cathode Deterioration  
5.1.5 Performance of Complete Cells; 5.1.6 Bipolar Plates; 5.1.7 Stacks; 5.1.8 Gas Turbine Integration with an MCFC; 5.1.9 Nickel Oxide Deposition at the Cathode at High Pressure; 5.1.10 Nickel Behaviour, Short-Circuiting; 5.1.11 MCFC Integration with Coal Gasification; 5.2 MCFC Status; 5.3 Remarks; 6 Polymer Electrolyte and Direct Methanol Fuel Cells; 6.1 Introduction; 6.1.1 Ballard Power Systems; 6.1.2 Ballard History; 6.1.3 Ballard Status; 6.1.4 Ballard Stacks; 6.1.5 Flexible Graphite and Ballard; 6.1.6 Ballard MEAs; 6.1.7 Nafion and Alternatives  
6.1.8 Alternative Flow Plate Materials Used by Competitors

---

## Sommario/riassunto

Fuel cell technology is the most exciting and legitimate alternative source of power currently available to us as world resources of non-renewable fuel continue to be depleted. No other power generating technology holds the same benefits that fuel cells offer, including high reliability and efficiency, negligible environmental impact, and security of supply. Fuel cells run on hydrogen - the simplest and most plentiful gas in the universe - although they can also run on carbon monoxide, methane, or even coal. Their applications are diverse, from powering automobiles, buildings and portable elec

---