Contents

Preface ix

Acknowledgments xi

Conference Committee and Staff xiii

Session Officials xv

HYDROGEN PRODUCTION

Production Economics for Hydrogen, Ammonia, and Methanol during the 1980–2000 Period
H. G. Corneil, F. J. Heinzelmann, and E. W. S. Nicholson **3439**

Comparison of Two Hydrogen Production Methods for Nuclear-Hydrogen Conversion
S. E. Ossami **3459**

Status of DOE (STOR)-sponsored National Program on Hydrogen Production from Water via Thermochemical Cycles
C. E. Baker **3479**

Water Splitting: The Chemistry of the I_2–SO_2–H_2O Reaction and the Processing of H_2SO_4 and HI Products
J. H. Norman, K. J. Mysels, D. R. O'Keefe, S. A. Stowell, and D. G. Williamson **3495**

Thermochemical Water Splitting Process Using Iron-Copper-Chlorine Cycle
A. Sasaki, M. Tamai, K. Masai, F. Sato, and M. Harada **3527**

A Highly Efficient Thermochemical Cycle for Hydrogen Production
M. A. Soliman **3541**

Hydrogen from the Wind—A Clean Energy System
Michael Dubey **3551**

Hydrogen Fuel Production by Wind Energy Conversion
E. Ben-Dov, Y. Naot, and P. S. Rudman **3563**

State of Development in the Area of Water Electrolysis (Near Term)
P. W. T. Lu and S. Srinivasan **3577**

A New Electrolytic Cell Type for Hydrogen Production in Hybrid Cycles
G. H. Schütz and D. R. Lalonde **3605**

Hydrogen Production at Reduced Cost through Electrolysis and Buoyancy
J. Horvath **3629**

Liquid Hydrogen from Solar Energy Now
H. C. Zachmann **3637**

A Self-consistent Process of Producing Hydrogen from Sea Water
M. A. K. Lodhi **3669**

Biocatalytic Production of Hydrogen by an *In Vitro* System
D. O. Hall, K. K. Rao, G. G. Reeves, and I. N. Gogotov **3675**

HYDROGEN STORAGE

State-of-the-Art Summary of the Technical Problems Involved in the Storage of Hydrogen via Metal Hydrides
G. Strickland **3699**

A Survey of the Hydrogen Storage Properties of Nickel-Copper-Mischmetal-Calcium alloys
G. D. Sandrock **3713**

The Use of Manganese Substituted Ferrotitanium Alloys for Energy Storage
J. R. Johnson and J. J. Reilly **3739**

The Potential of Zeolite Molecular Sieves as Hydrogen Storage Media
D. Fraenkel, R. Lazar, and J. Shabtai **3771**

Modification of Hydriding Properties of AB_5 Type Hexagonal Alloys through Manganese Substitution
C. E. Lundin and F. E. Lynch **3803**

HYDROGEN UTILIZATION

Hydrogen Homestead
Roger E. Billings, Ronald L. Woolley, Barrie C. Campbell, Jack H. Ruckman, and Vaughn R. Anderson **3823**

The Self-Propelled Hydrogen-Powered Refrigerator Car
R. L. Whitelaw **3843**

Hydrogen Energy Transport Systems and Nuclear Heat: A Promising Way to Conserve Fossil Energy Resources
K. O. Laughon and J. H. Swisher **3855**

Optimum Design of Automotive Vehicles Employing Alternate Energy Sources of Low Energy Density: Impact on Selection of an Energy-Carrier for Future Urban Vehicle Transportation System
Robert F. McAlevy, III **3877**

Hydrogen as a Mid-term Gaseous Fuel Supplement by Blending with Natural Gas
G. F. Steinmetz **3889**

Air-Water Synthesis of Ammonium Nitrate
R. G. Garza, R. G. Hickman, and P. C. Souers **3911**

Feasibility Study of a Regenerative Solid Polymer Electrolyte Fuel Cell System Using Hydrogen/Chlorine Reactants for High Efficiency Energy Storage
L. J. Nuttall, J. F. McElroy, S. Srinivasan, and T. G. Hart **3919**