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Production -- Transformation of Crystalline Cellulose IIII to Cellulose I in Semi-Flow Hot-Compressed Water Treatment -- Physico-Chemical Properties of Biodiesel from Various Feedstocks -- Woodfuel utilization for cooking in Indonesian household: Assessment of indoor PM10 pollution and wood consumption at national level -- Characterization of Hydrogen Jet Development in an Argon Atmosphere -- Fabrication of Strontium Titanate Nanofibers via Electrospinning -- A Study on Lithium Recovery from Seawater: Separation of Lithium from Hydrochloric Acid Solutions Containing CaCl2, MgCl2, MnCl2, NaCl, KCl, and LiCl -- Synthesis of Silver Nano-wires without Seeds by the Polyol Process -- Relaxation Analysis of Li Inserted -Fe2O3 at Various Rates -- Thermal Stability and Catalytic Performance of Pd, Pt and Rh Loaded on CuO-CeO2-Al2O3 Support for Three-way Catalysts -- Inherently-safe High Temperature Gas-cooled Reactor -- Monte Carlo Calculations of -rays Angular Distribution Scattering from 11B in (,) Interaction -- Optimization of the new designed FEL beam transport line -- Diamagnetic effect on the ripple-induced losses of energetic ions in a non-axisymmetric tokamak plasma -- Formulation of the two-dimensional heat transport equation in tokamak plasmas -- Application of Very High Speed Camera in Measurement of Liquid Film Flow on Nuclear Rod Bundle in Micro-scale -- Evaluation of Tritium Production in LiPb Blanket System Using Neutrons Analysis -- Analysis of SNIP Algorithm for Background Estimation in Spectra Measured with LaBr3:Ce Detectors -- Verification of nonlinear collision effect on energetic ion confinement in toroidal plasmas -- The Rheological Characters of Surfactant Viscoelastic Solutions at Low Shear Rate -- Characteristics of velocity fields and polymers’ elongation in elastic turbulent flow -- Visualization Study on Bubbly Turbulent Flow in a Small Square Duct -- A Feasibility study of a medical application of cylindrical discharge type fusion neutron beam source.

Sommario/riassunto

This is the final year of the 5-year Global COE (Center of Excellence) Program "Energy Science in the Age of Global Warming – Toward a CO2 Zero-Emission Energy System" of the Ministry of Education, Culture, Sports, Science and Technology of Japan. This program aims to establish an international education and research platform to foster educators, researchers, and policy makers who can develop technologies and propose policies for establishing a scenario toward a CO2 zero-emission society no longer dependent on fossil fuels, by the year 2100. Since 2008, four departments of Kyoto University—the Graduate School of Energy Science, the Institute of Advanced Energy, the Department of Nuclear Engineering, and the Research Reactor Institute—have joined together to engage in the management of the Program. The Fourth International Symposium of the Global COE, titled “Zero-Carbon Energy, Kyoto 2012,” was held jointly with the Joint Graduate School of Energy and Environment / Center of Excellence on Energy Technology and Environment (JGSEE/CEE) at King Mongkut's University of Technology, Thonburi (KMUTT) in Bangkok, Thailand in May 2012. This book is a compilation of the lectures and presentations from the symposium. Securing energy and conservation of the environment are the most important issues for the sustainable development of human beings. The energy problem cannot be simply labeled a technological one, as it is also deeply involved with social and economic elements, and it is essential to establish low carbon-energy science as an interdisciplinary field.