

Research Report  
of  
Kitakyushu National College of Technology

Vol. 43

January, 2010

CONTENTS

Combustion Improvement of the SI4cycle Engine with an Expansion of Discharge Gap .....	<i>Shigeki HIRASHIMA and Shota IKAWA</i> .....	1
Development of Speed-variable-type Three-point-bending Impact Testing Apparatus (Part III : Crack Propagation and Macrofractography) .....	<i>Takeshi UCHIDA and Akinori YACHIGO</i> .....	7
Cantilever-type Rotating Bending Fatigue Behavior of PC Notched Specimen .....	<i>Takeshi UCHIDA and Masahiro YAMATO</i> .....	15
The Time Variation of Electromagnetic Effect in Iron-Based Ferromagnetic Oxide Sputtered Films .....	<i>Atsushi KAJIMA, Kentaro TSUDA, Takuya OKUNAGA, Kazutaka HONGO, Hideaki ABURATANI and Kenta KIRIMOTO</i> .....	21
The Private Electric Power Plant and the Transmission Grid Constructed in the Electrified Irrigation Project of the Northern Mizuma Country .....	<i>Atsushi KAJIMA</i> .....	25
A Variable Speed Control of Wind Power System Using Wound Rotor Induction Generator.....	<i>Takahiro MIYAKAWA</i> .....	35
Development of Hydrogen Radical Sources Using Atmospheric-pressure Micro Plasma Jets .....	<i>Tsuyoshi FUKUZAWA, Kazuhisa MURAKAMI, Koichi HIRAKAWA and Sukeomi OGI</i> .....	41
Numerical Analysis of Turbulent Jet from Two-Dimensional Sonic Nozzle (2 <sup>nd</sup> Report, Impingement to Perpendicular Plate) .....	<i>Hideo KASHIMURA, Yoshiaki MIYAZATO and Kazuyasu MATSUO</i> .....	45
A Trial of Semantic Processing System using Ruby Language .....	<i>Masahiro WAKIYAMA, Takamitsu KATSUKI, Yasunobu HITAKA and Shota YOSHIHARA</i> .....	51
Vibration Suppression Control for Articulated Robot.....	<i>Hiroshi HAMAMATSU and Hiroshi SHIWA</i> .....	55
Effect of Mass Flow Rate and Pressure Ratio for Hysteresis Phenomenon of Shock Wave Reflection in Supersonic Axisymmetric Jet .....	<i>Tsuyoshi YASUNOBU, Yumiko OTOBE and Hideo KASHIMURA</i> .....	59
Effect of Nozzle Exit Diameter on Jet Structure of Axisymmetric Supersonic Jet .....	<i>Yumiko OTOBE, Takafumi OUCHI, Hideo KASHIMURA and Toshiaki SETOBUCHI</i> .....	65
Pilot Plant Study on Sludge Digestion System with Nitrogen Removal .....	<i>Chiaki HATANAKA, Kiyoshi KUMADA and Goro KOBAYASHI</i> .....	69
Preparation and Characterization of CaO-Bi <sub>2</sub> O <sub>3</sub> Complex Oxide .....	<i>Shigenori MATSUSHIMA, Kohei YOSHIDA and Kenji OBATA</i> .....	75
Surface Treatment of Polymer Thin films by CO <sub>2</sub> Ion-implantation Method .....	<i>Hirokazu YAMANE, Yuri HASHIMOTO, Kenji YAMADA and Tisato KAJIYAMA</i> .....	79
Esterification Reaction in Non-aqueous Media by Using Multi Layer Immobilized Enzyme .....	<i>Muneharu GOTO, Ryosuke OTA, Hidetaka KAWAKITA and Kazuya UEZU</i> .....	83
Study of Physiologically Active Peptides by Enzymatic Hydrolysis of Flour Protein .....	<i>Ryosuke MAEDA, Yuichi SHIMIZU and Chiaki HATANAKA</i> .....	87
Behavior of EMF drift and CO <sub>2</sub> Sensing Properties on Potentiometric NASICON-Based CO <sub>2</sub> Sensor .....	<i>Kenji OBATA, Yuya NAKAO and Shigenori MATSUSHIMA</i> .....	93
Characteristic Feature Evaluation of the New Type Dielectric Discharge Ionizer .....	<i>Satoshi NISHIZAWA, Hiroyuki NAKAMURA, Kenji YAMADA, Shigenori MATSUSHIMA and Kenji OBATA</i> .....	99
Historical transition of TOKA-EBISU "Open Gate" Ceremony in Nishinomiya Shinto Shrine.....	<i>Hironori ARAKAWA</i> .....	105
Mother Goose Gives Us a Clue to a Mystery .....	<i>Yumiko KIDA</i> .....	115
A Report of Student Counseling Activities at Kitakyushu National College of Technology .....	<i>Minoru MIZUMOTO, Maiko KITAZAKI, Kazuko TAKIMOTO and Mariko MATSUMOTO</i> .....	121
A Study of the situation of Christianity in modern China, (1) –Especially the case of Ningbo and Shanghai. – .....	<i>Tsutomu ABE</i> .....	138
A List of other Research Activities in 2008.....		139