

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

CONTENT

PROBLEMS OF THE POLISH POWER SYSTEM DEVELOPMENT.....	15
Wojciech Suwała, Artur Wyrwa	
CIRCULAR ECONOMY AND CLEAN AIR AS A PART OF INNOENERGY ACTIVITIES	
Marcin Lewenstein.....	16
THE POSSIBILITY OF USING LOW-LOSS AMORPHOUS MAGNETIC MATERIALS IN	
ENERGY APPLICATIONS.....	17
Grzegorz Kmita	
ELECTROMOBILITY: JOHNSON MATTEY THE LEADER OF BATTERY PRODUCTION	
FOR E-BIKES AND LIGHT E-MOBILITY: COLLABORATION, CAREER.....	18
Petr Grzegorz, Kinga Młoczek-Harazim	
ESTIMATION OF ONE-YEAR OPERATION OF HYBRID HEAT SOURCE FOR HEATING	
THE BUILDING AND PREPARATION OF HOT WATER.....	19
David Taler, Rafał Pitry, Jan Taler	
IMPLEMENTATION OF ENERGY HARVESTING SYSTEM OF WASTES OF	
COMPRESSED AIR WASTES FOR ELECTRICAL STEEL CUTTING LINE.....	20
Dominik Gryboś, Jacek S. Leszczyński	
DESIGNING NUCLEAR REACTORS OF ADVANCED TECHNOLOGIES. COMPARISON	
OF COMPUTER SIMULATIONS AND EXPERIMENT.....	21
Jerzy Cetnar, Grażyna Domańska	
THORIUM BASED FUEL LOADING PATTERN FOR PWR REACTOR.....	22
Mikołaj Oettingen	
CCGT AND SMALL NUCLEAR SMR HYBRIDS SYSTEM FOR FLEXIBLE ENERGY	
GENERATION.....	23
Ludwik Pieńkowski, Marek Jaszczur, Michał Dudek, Katarzyna Skolik	
THE REGENERATIVE AIR HEATING FOR A BIOMASS BURNING FURNACE.....	24
Artur Cebula, Sebastian Kowalczyk, Szymon Szufa, Piotr Piersa, Łukasz Adrian	
MODEL OF MEDIUM-TERM FORECAST OF ENERGY MIX IN POLAND.....	25
Janusz Sowiński	
GLOBAL ENERGY INVESTMENTS - TRENDS AND PERSPECTIVES.....	26
Piotr Janusz, Maciej Kaliski	
SOLAR-WIND-BATTERY HYBRIDS FOR RURAL HOUSEHOLDS IN POLAND -	
SPATIAL ANALYSIS OF ECONOMIC JUSTIFICATION.....	27
Alexander Kies, Jakub Jurasz	
TESTING THE PERFORMANCE CHARACTERISTICS OF SPECIFIC PROFILES FOR	
APPLICATIONS IN WIND TURBINES.....	28
Stanisław Gumuła-, Krzysztof Pytel, Wiktor Hudy, Małgorzata Paskowska - Silarska Marcin	
Kowalski, Piotr Dudek, Sebastian Bielik	
E-MOBILITY - INFLUENCE ON THE POWER GRID AND THE PROFITABILITY FOR	
USERS.....	29
Damian Burzyński, Robert Pietracho, Leszek Kasprzyk	
FLUE GAS DESULPHURIZATION WASTEWATER TREATMENT BY COAGULATION	
WITH ALUMINUM-BASED COAGULANTS.....	30
Maciej Majewski, Jarosław Zawadzki, Piotr Marcinowski, Jan Bogacki, Sridhar Sivakumar	
INTEGRATION ADSORPTION CHILLERS WITH CONVENTIONAL POWER PLANT..	31
Karol Sztékler, Wojciech Kalawa, Sebastian Stefański, Łukasz Mika, Jarosław Krzywanski, Karolina	
Grabowska, Wojciech Nowak	

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

COMPARISON OF NUSCALE SMR MODELLING AND STEADY STATE PARAMETERS IN RELAP/SCDAPSIM AND MELCOR CODES.....	32
Katarzyna Skolik, Mateusz Malicki, Ludwik Pieńkowski	
MONITORING OF TRANSIENT FLUID TEMPERATURE AND THERMAL STRESSES IN THICK-WALLED CYLINDRICAL ELEMENTS.....	33
Magdalena Jaremkiewicz, Piotr Dzierwa, Dawid Taler, Jan Taler	
DEVELOPMENT OF NOVEL MATERIALS FOR THE AIR ELECTRODE FOR SOFC AND SOEC TECHNOLOGIES.....	34
Konrad Świerczek, Anna Niemczyk	
POTENTIAL OF PHOTOVOLTAICS TO COMPENSATE FOR ENERGY DROUGHTS IN WIND ENERGY SECTOR.....	35
Jakub Jurasz	
THE VIRTUAL POWER PLANT - A REVIEW OF BUSINESS MODELS.....	36
Magdalena Węglarz, Edyta Ropuszyńska-Surma	
SENSITIVITY OF FORCED CONVECTION ON INFLUENCE OF MAGNETIC FIELD	37
Łukasz Pleskacz, Elżbieta Fornalik-Wajs	
THE EFFECT OF HYDRATED LIME ADDITION ON THE RETENTION OF TRACE ELEMENTS IN ASH FROM COAL DUST COMBUSTION.....	38
Wojciech Jerzak, Paweł Murzyn, Monika Kuźnia, Anna Magiera	
IMPACT OF THE CAPITAL STRUCTURE ON THE MARKET VALUE OF COMPANIES IN THE ENERGY SECTOR - USING THE EXAMPLE OF POLISH COMPANIES.....	39
Robert Ranoż	
INFLUENCE OF THE CO ₂ EMISSION FACTOR VALUE ON THE RESULT OF THE LOAD DISTRIBUTION ANALYSIS BETWEEN THE HYBRID PV/WT/FC SYSTEM AND THE ELECTRIC POWER SYSTEM.....	40
Bartosz Ceran	
THE OPERATION AND CAPACITY FADE MODELLING OF THE LITHIUM-ION CELL FOR ELECTRIC VEHICLES.....	41
Damian Burzyński, Leszek Kasprzyk	
RESPECT INDEX AS A PROJECT PROMOTING THE HIGHEST STANDARDS OF RESPONSIBLE MANAGEMENT IN ENERGY SECTOR.....	42
Patrycja Bąk, Marta Sukiennik	
COBALT-BASED A-SITE LAYERED PEROVSKITES FOR APPLICATION AS CATHODE MATERIALS IN SOLID OXIDE FUEL CELLS.....	43
Anna Olszewska, Konrad Świerczek	
STRUCTURAL CHANGES IN SMALL POWER BOILERS OVER THE LAST YEARS....	44
Jarosław Bartoszewicz	
PERSPECTIVES OF MODERN ENERGY STORAGE IN MINISCULE PHOTOVOLTAIC INSTALLATIONS.....	45
Danuta Olszewska, Paulina Kiełczykowska, Miłosz Olszewski	
THE INFLUENCE OF THE EMISSION LIMITS ON THE ENERGY SECTOR.....	46
Anna Bluszcz	
LI _{3xLA} ₂ /3-xTiO ₃ AS A CERAMIC MEMBRANE FOR HIGH ENERGY DENSITY LITHIUM METAL CELLS.....	47
Tomasz Polczyk, Wojciech Zając, Konrad Świerczek	
THE FORMATION OF ORGANIZATIONAL CULTURE IN THE ASPECT OF LEAN MANAGEMENT PRINCIPLES IN THE ENERGY INDUSTRY.....	48
Marta Sukiennik, Patrycja Bąk	

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

INVESTMENT EXPENDITURES TO PROTECT THE ENVIRONMENT IN POLISH MINING	49
Romuald Ogrodnik	
THE IMPACT OF SELECTED MACROECONOMIC FACTORS ON THE LEVEL OF EXPENDITURES USED TO PROTECT THE ENVIRONMENT.....	50
Romuald Ogrodnik	
ELECTRICITY USED AS ADDITIONAL MEDIUM FOR SUPPORT HOUSEHOLD SPACE HEATING.....	51
Jerzy Andruszkiewicz, Józef Lorenc, Agnieszka Maćkowiak	
INVESTIGATION OF FLOW NON-UNIFORMITIES IN THE CROSS-FLOW HEAT EXCHANGER WITH ELLIPTICAL TUBES.....	52
Stanisław Łopata, Paweł Ochoń, Tomasz Stelmach	
ADSORPTION BED CONFIGURATIONS FOR ADSORPTION COOLING APPLICATION	
Sebastian Stefański, Wojciech Kalawa, Łukasz Mika, Karol Sztekler.....	53
THE TAJIKISTAN PROJECT: ENERGY FOR EDUCATION.....	54
Hubert Stinia, Joanna Maraszek, Anna Ścierańska, Muhammadjon Odinabekov, Dilshod Rajabov, Dilnoza Nabieva, Gulnora Anvarova, Magdalena Dudek, Andrzej Rażniak	
THE SECURITY OF THE POLISH OIL SECTOR	55
Tadeusz Olkusi, Adam Szurlej, Barbara Tora, Piotr Janusz	
ANALYSIS OF THE POTENTIAL OF DEMAND SIDE RESPONSE PROGRAMS IN ENERGY CLUSTERS.....	56
Andrzej Manujło, Mariusz Kaleta	
MODELING OF NEUTRON FLUX TIME EVOLUTION IN ACCELERATOR DRIVEN SYSTEM.....	57
Paweł Gajda, Michał Orliński	
ROLE OF NANOFLUIDS IN ENERGY SYSTEMS.....	58
Aleksandra Roszko, Elżbieta Fornalik-Wajs	
AN ANALYSIS OF PHOTOVOLTAICS AS SUMMER'S ON-PEAK SOURCE IN POLAND	
Bartosz Sobik	59
ANALYSIS OF COAL BED METHANE OBTAINING AND USE IN POLISH CONDITIONS.....	60
Sebastian Napieraj	
TRANSPORT OF POLLUTANTS ASSOCIATED WITH PARTICULATE MATTER TO THE ENVIRONMENT - FIELD EXPERIMENTS WITH PHOTOVOLTAIC PANELS.....	61
Katarzyna Styszko, Alicja Skiba, Marek Jaszczur, Janusz Teneta, Ewelina Marcinek, Natalia Guzik, Sylwia Radzięta, Lucyna Samek	
COMFORT OF LIFE AND WORK IN THE ASSESSMENT OF THE PROFESSIONAL GROUP OF EMPLOYEES IN THE ENERGY SECTOR ON THE BASIS OF A MINING COMPANY.....	62
Barbara Kowal	
ANALYSIS OF THE ANTI-ICING SYSTEM USED IN AIR HANDLING UNIT WITH COUNTERFLOW HEAT EXCHANGER.....	63
Marek Jaszczur, Sławosław Kleszcz, Marek Borowski	
THE ROLE OF LNG SUPPLIES FOR BALANCING THE NATURAL GAS DEMAND IN THE EU COUNTRIES.....	64
Rafał Biały, Piotr Janusz, Mariusz Łaciak, Tadeusz Olkusi, Mariusz Ruszel, Adam Szurlej	

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

COMPARISON OF CO ₂ GASIFICATION OF COAL IN ISOTHERMAL AND NON-ISOTHERMAL CONDITIONS.....	65
Grzegorz Czerski, Przemysław Grzywacz, Katarzyna Zubek	
EFFECT OF TEMPERATURE AND TYPE OF BIOMASS DURING THE PRODUCTION OF SOLID FUEL ASHES ON THEIR COMPOSITION AND PROPERTIES IN COMPARISON WITH COAL ASHES.....	66
Jin Horak, Lenka Kubonova, Milan Dej, Vendula Laciok, František Hopan, Kamil Krpec	
THE SELECTION OF OPTIMAL CONDITRIONS FOR OBTAINING HUMIC ACID FROM LIGNITE.....	67
Edyta Janeba-Bartoszewicz, Damian Romek, Jarosław Selech, Jacek Marcinkowski, Włodzimierz Kęska	
BIOGAS PRODUCTION FROM AGRICULTURAL AND MUNICIPAL WASTE	68
Monika Kuźnia, Anna Magiera, Wojciech Jerzak, Kinga Pielichowska, Jakub Sikora	
DEGRADATION OF PETROLEUM DIESEL FUEL ACCELERATED BY UV IRRADIATION: THE IMPACT OF AGEING ON CHEMICAL COMPOSITION AND SELECTED PHYSICOCHEMICAL PROPERTIES.....	69
Rafał Janus, Karol Kołomański, Mariusz Wądrzyk, Marek Lewandowski	
MERCURY EMISSION BENCHMARKS FROM HARD COAL COMBUSTION IN POLISH POWER PLANTS.....	70
Michał Wichliński, Grzegorz Wielgosz, Rafał Kobyłecki	
THERMOCHEMICAL ENERGY STORAGE - FROM FUNDAMENTAL RESEARCH TO TRL IV.....	71
Piotr Babiński, Michalina Kotyczka - Morańska, Jarosław Zuwała	
IMPROVING THE PROPERTIES OF LI4Ti5O12 - A PROMISING ANODE MATERIAL FOR LITHIUM-ION BATTERIES.....	72
Danuta Olszewska, Jakub Niewiedział, Jakub Boczkowski	
EVALUATION OF GROUND POLLUTION BY HYDROCARBONS USING ROCK-EVAL PYROLYSIS.....	73
Dariusz Więclaw, Maria Sadlik	
ANALYSIS OF THE POSSIBILITY OF IDENTIFYING INCORRECT OPERATION OF HEATING DEVICES IN REAL CONDITIONS.....	74
Adam Nygard, Jarosław Bartoszewicz, Rafał Urbaniak	
HEAT TRANSFER INTENSIFICATION BY JET IMPINGEMENT - NUMERICAL ANALYSIS USING RANS APPROACH.....	75
Tomasz Kura, Elżbieta Fornalik-Wajs, Jan Wajs, Sasa Kenjeres	
OPTIMIZATION OF THE HEAT-RECOVERY, NON-RECOVERY COKE OVEN OPERATION.....	76
Rafał Buczyński, Ronald Kim, Roman Weber	
IN-DEPTH INVESTIGATION ON OPTIMIZED PROCESS TECHNOLOGY AND EMISSION CONTROL FOR HORIZONTAL-, HEAT RECOVERY- AND VERTICAL CHAMBER COKE OVEN PLANTS.....	77
Ronald Kim	
ETHERS AS BIOCOMPONENTS OR SUBSTITUTES OF GASOLINE FUELS - THE NEED FOR NEW TECHNOLOGY.....	78
Grzegorz S. Jodłowski, Grzegorz Skalski	
CHEMICAL COMPOSITION AND THE QUALITY OF COAL FROM THE BOGDANKA BITUMINOUS COAL MINE, LUBLIN COAL BASIN, POLAND.....	79
Barbara Bielowicz, Jacek Misiak	

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

CHANGES IN THE SPONTANEOUS COMBUSTION TENDENCY OF HUMIC COALS ACCORDING TO THEIR PETROGRAPHIC COMPOSITION AND TECHNICAL AND CHEMICAL PROPERTIES.....	80
Barbara Bielowicz, Natalia Maciejńczyk	
EXAMINATION OF STEAM GASIFICATION OF COAL WITH PHYSICALLY MIXED CATALYSTS.....	81
Katarzyna Zubek, Grzegorz Czerski, Agnieszka Sopata	
A TEST-BENCH FOR INVESTIGATION OF SOFC FUELLED WITH GASES CONTAINING SOLID PARTICLES.....	82
Marek Skrzypkiewicz, Michał Wierzbicki, Konrad Motyliński, Stanisław Jagielski, Grzegorz Kosiński	
CHAR FROM COCONUT AND PISTACHIO SHELLS AS PROMISING WASTE BIOMASS FUEL FOR DIRECT CARBON SOLID OXIDE FUEL CELLS.....	83
Bartosz Adamczyk, Magdalena Dudek, Marta Klimczyk, Miguel Cardona-Salazar, Marek Skrzypkiewicz	
REVERSIBLE SOLID OXIDE FUEL CELLS INVOLVING A CERAMIC PROTON CONDUCTOR.....	84
Bartłomiej Lis, Magdalena Dudek, Milena Kosim, Hubert Hojdus, Michał Mosiątek, Robert P. Socha, Sabrina Presto, Massimo Viviani, M. Paola Carpanese, Antonio Barbucci, Tomas Šalkus, Edvardas Kazakevicius, Algimantas Kežionis	
SYNTHESIS OF ZEOLITE P FROM SEWAGE SLUDGE ASH.....	85
Jolanta Latosińska	
THE INFLUENCE OF DRILLING WASTE MANAGEMENT AND MINING ACTIVITIES RELATED WITH THE EXPLORATION FOR HYDROCARBONS FROM UNCONVENTIONAL ACCUMULATIONS ON THE NATURAL ENVIRONMENT IN POLAND.....	86
Justyna Pyssa	
CONDITIONS OF HAZARDOUS WASTE MANAGEMENT IN POLAND IN ASPECT OF SUSTAINABLE DEVELOPMENT.....	87
Justyna Pyssa	
MICROSPHERES AS POTENTIAL FILLERS IN COMPOSITE POLYMERIC MATERIALS Anna Magiera, Monika Kuźnia, Wojciech Jerzak Magdalena Ziąbka, Radosław Lach, Bartosz Handke	88
THE PREPARATION OF COMPOSITE SOLID FUELS USED IN THE COMBUSTION PROCESS.....	89
Bogdan Kosturkiewicz, Andrzej Janewicz	
THE SIGNIFICANCE OF ENERGY CONSUMPTION IN ENVIRONMENTAL IMPACT OF RARE EARTH ELEMENTS RECOVERY FROM TAILINGS AND MINING WASTE	90
Karolina Kossakowska, Katarzyna Grzesik	
ANALYSIS OF HAZARDS OCCURRING DURING THE USE OF HYDRAZINE	91
Edyta Janeba-Bartoszewicz*, Adam Rojewski	
HYDROTHERMAL PROCESSING OF PINE WOOD: EFFECT OF PROCESS VARIABLES ON BIO-OIL QUALITY AND YIELD.....	92
Mariusz Wądrzyk, Magdalena Berdel, Rafał Janus, Derk Willem Frederik Brilman	
FUEL TYPE AND EMISSION OF POLLUTANTS.....	93
Dorota Koruba, Jerzy Zbigniew Piotrowski, Robert Piekoszewski	
PHOTODEGRADATION OF AIR POLLUTANTS USING A CONCRETE LAYER WITH THE ADDITION OF AMPHIBOLITE.....	94
Beata Szczepanik, Piotr Słomkiewicz, Dariusz Widel, Paweł Rogala, Nina Rędzia	

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

THE ENERGY EFFICIENCY IN EFFECT - WORK OF GLASS FACTORY TRENDGLASS Nina Rędzia.....	95
CONTAMINATION ASSESSMENT OF SOIL BY OIL-DERIVED COMPOUNDS OF THE KIELCE AGGLOMERATION USING GAS CHROMATOGRAPHY COUPLED WITH MASS SPECTROMETRY (GC-MS).....	96
Natalia Kmiecik, Krzysztof Jurek, Adam Kowalski	
CONTENTS OF ECOTOXIC ELEMENTS IN POLISH COKING BITUMINOUS COALS AND IN PRODUCTS OF COKING PROCESS.....	97
Piotr Burmistrz, Tadeusz Dziok, Dorota Makowska, Faustyna Wierońska, Andrzej Strugała	
THE REDUCTION OF ECOTOXIC ELEMENTS IN HARD COAL VIA DRY SEPARATION PROCESS.....	98
Dorota Makowska, Wiktor Pacura, Artur Mazgała, Faustyna Wierońska, Tadeusz Dziok	
THE EFFECT OF FLUE GAS TEMPERATURE ON MERCURY REMOVAL WITH ORGANIC SORBENT.....	99
Marta Marczak, Stanisław Budzyń, Piotr Burmistrz	
INFLUENCE OF WATER AND COAL POWER PLANT ASH ADDITION TO DECOMPOSITION OF ORGANIC MATTER IN COAL WASTES. A CASE STUDY OF JANINA COAL MINE WASTE DEPOSIT.....	100
Robert Kruczek, Dariusz Więclaw, Tomasz Romanowski	
MECHANOCHEMICALLY ASSISTED SYNTHESIS OF SEMICONDUCTING KESTERITE CU ₂ ZNSNS ₄ FOR PHOTOVOLTAIC APPLICATIONS.....	101
Katarzyna Kapusta, Mariusz Drygaś, Jerzy F. Janik	
GAALN BINARY NITRIDE SOLID SOLUTION AS A POTENTIAL MATERIAL FOR HIGHLY EFFICIENT WHITE LIGHT SOURCES.....	102
Mariusz Drygaś, Katarzyna Kapusta, Jerzy F. Janik	
THE IMPROVEMENT OF SYNTHESIS TECHNOLOGY OF OXYGEN-GENERATING ADDITIVES TO DIESEL FUEL.....	103
Viktoriiia Ribun, Sergey Kurta, Taras Gromov	
SEQUESTRATION OF CO ₂ - PROBLEMS AND POSSIBILITIES - CZECH REPUBLIC AND POLAND CASE.....	104
Marcela Davidova, Grzegorz S. Jodłowski	
ENERGY TECHNOLOGIES INVOLVING COAL - PRESENT AND FUTURE IN HUNGARY AND POLAND - A SURVEY.....	105
Janos Lakatos, Grzegorz S. Jodłowski	
ANALYSIS OF COAL BED METHANE OBTAINING AND USE IN POLISH CONDITIONS.....	106
Sebastian Napieraj	
EVALUATION OF THE IMPACT OF METEOROLOGICAL CONDITIONS ON THE AMOUNT OF AIR POLLUTION.....	107
Małgorzata Piaskowska - Silarska, Krzysztof Pytel, Wiktor Hudy, Stanisław Gumuła	
AN ANALYSIS OF COAL PRODUCTS SALES WITH REFERENCE TO ENVIRONMENTAL REGULATIONS OF THE EUROPEAN UNION.....	108
Anna Manowska	
POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) ASSOCIATED WITH PM ₁₀ FROM SMALL CITY OF KRAKOW AGGLOMERATION.....	109
Alicja Skiba, Katarzyna Styszko, Przemysław Furman, Natasza Dobrowolska, Magdalena Kistler, Anne Kasper-Giebl, Damian Zięba	

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

METHODS OF DISPOSAL OF BIODIESEL PRODUCTION BY-PRODUCTS.....	110
Edyta Strzelec, Grzegorz S. Jodłowski	
SELECTED ASPECTS OF DESIGN AND CONSTRUCTION OF HYBRID POWER SOURCES (BATTERY AND PEMFC STACK) DESIGNED TO SUPPLY DRONES. ...	111
Bartłomiej Lis, Andrzej Rażniak, Tomasz Siwek, Magdalena Dudek	
SYNTHESIS OF 2-METHYLFURAN AND FURAN VIA HYDROGENATION OF FURFURAL AND FURFUROL OVER CHROMITE-BASED CATALYSTS.....	112
Katarzyna Samson, Wojciech Rojek, Małgorzata Ruggiero-Mikołajczyk, Michał Śliwa, Łukasz Kuterasiński, Dorota Rutkowska-Zbik	
FROM MINERAL TO CATALYST - TRENDS IN APPLICATION OF LAYERED CLAY MINERALS IN ENVIRONMENTAL CATALYSIS.....	113
Lucjan Chmielarz	
CIRCULAR ECONOMY - NEW PARADIGM OF THE FUTURE.....	114
Krzysztof Pi koń	
ISOSTERIC HEAT OF SORPTION OF METHANE ON SELECTED HARD COALS ...	115
Mirosław Wierzbicki, Anna Pajdak, Paweł Baran	
FLY ASH DERIVED ZEOLITES AS POTENTIAL HG SORBENTS IN ENERGY SECTOR	116
Magdalena Wdowin	
THE IMPACT OF SUPPORT ON CATALYTIC ACTIVITY OF RU-BASED CATALYSTS IN THE HYDROGENATION OF SELECTED KETONES.....	117
Dorota Duraczyńska, Ewa M. Serwicka, Alicja Michalik, Bogna D. Napruszewska, Robert P. Socha	
ROLE OF SUPPORT FOR STRUCTURAL, TEXTURAL AND FUNCTIONAL PROPERTIES OF NICKEL-BASED CATALYSTS ACTIVE IN DRY REFORMING OF METHANE ...	118
Andrzej Adamski, Piotr Legutko, Katarzyna Dziadek, Ksenia Parkhomenko, Cyril Aymonier, Vladislav A. Sadykov, Anne-Cecile Roger	
APPLICATION OF FLY ASH FOR MINERAL CARBONATION OF CO ₂	119
Katarzyna Zarębska, Agnieszka Ćwik, Ignasi Casanova, Natalia Czuma, Paweł Baran, Piotr Zabierowski	
ACIDIC PROPERTIES OF MESOPOROUS [AL]MCM-41 AND [AL]JSBA-15.....	120
Agnieszka Szymaszek, Bogdan Samojeden, Teresa Grzybek, Roger Gläser, Magdalena Jabłońska	
CARBON SUPPORTED CERIUM-COPPER CATALYSTS FOR LOW-TEMPERATURE REMOVAL OF NOX FROM STATIONARY SOURCES OF EMISSION.....	121
Marwa Saad, Anna Białas, Cezary Czosnek, Monika Motak	
ZEOLITES FROM ASH AS CATALYSTS IN SCR-NH ₃	122
Bogdan Samojeden, Oliwia Ligeza, Paweł Baran, Monika Motak, Katarzyna Zarębska	
INFLUENCE OF PRETREATMENT CONDITIONS OF NI-CONTAINING FE-PROMOTED HYDROTALCITE-LIKE MATERIALS ON NI ⁰ CRYSTALLITE SIZE	123
Dominik Wierzbicki, Aleksandra Drzyżdżyk, Monika Motak, Teresa Grzybek	
EFFECT OF THERMAL TREATMENT ON THE STABILITY AND CRYSTALLITE SIZE OF CU-MG-FE HYDROTALCITE-DERIVED MATERIALS.....	124
Dominik Wierzbicki, Rafał Dębek, Marcin Bocheński, Monika Motak	
CATALYSTS BASED ON CARBON XEROGELS WITH HIGH CATALYTIC ACTIVITY IN THE REDUCTION OF NOX AT LOW TEMPERATURES.....	125
Ewelina Drwal, Esther Bailón-García, Maria Filipa Ribeiro, Carlos Henriques, Teresa Grzybek	
PERLITE BASED FIRERESISTANT AND INSULATING MATERIALS.....	126
Katarzyna Zarębska, Natalia Czuma, Paweł Baran, Piotr Zabierowski, Elżbieta Jószczuk	

ENERGY AND FUELS 2018

AGH UST, CRACOW UNIVERSITY OF TECHNOLOGY, KRAKOW, SEPTEMBER 19TH-21ST, 2018

ACTIVATED CHAR FROM BROWN COALS FOR CARBON DIOXIDE SORPTION...	127
Natalia Czuma, Katarzyna Zarębska, Agnieszka Dudzińska, Paweł Baran, Jakub Szczurowski	
MODIFICATION OF GEOPOLYMERS FROM FLY ASHES IN TERMS OF IMPROVING OF INSULATING PROPERTIES.....	128
Paweł Baran, Marzena Nazarko, Katarzyna Zarębska, Natalia Czuma, Adam Kanciruk, Elżbieta Włosieńska	
DEVELOPMENT OF TEMPERATURE-INDUCED STRAINS IN COAL-CH ₄ AND COAL- CO ₂ SYSTEMS.....	129
Paweł Baran, Katarzyna Zarębska, Agnieszka Ćwik, Katarzyna Czerw	