

9th International Symposium on Feedstock Recycling of Polymeric

Materials (9th ISFR 2017) 報告

東北大学 熊谷将吾

2015年7月10日～7月13日の4日間、チェコ共和国東部に位置するオストラバの VŠB - Technical University of Ostrava (オストラバ工科大学) にて、“9th International Symposium on Feedstock Recycling of Polymeric Materials (9th ISFR2017)”が開催されました。今回は、Recycling of polymers、Biomass and solid wastes、Catalytic process I&II、Pyrolysis, gasification and other energy processes I&II、およびフラッシュプレゼンテーション形式のポスターセッションから構成され、Kolomazník 教授 (Tomas Bata University in Zlín)、Olazar 教授 (University of the Basque Country UPV/EHU)、および上村教授 (山口大学) による基調講演、口頭発表 24 件、およびポスター発表 20 件の計 47 件の研究が報告されました。プラスチック・バイオマス等天然高分子のフィードストックリサイクル技術、プラスチックの材料リサイクル技術、炭素繊維強化プラスチックからの炭素繊維回収、リサイクルコンセプト、環境影響評価等、関連する幅広い分野の参加者が募ったため、専門分野の枠を超えた活発な議論が交わされていました。当プラスチックリサイクル化学研究会からも、上村副会長を始め多くの方が参加しました。

Gala dinner では、学生発表者全員に対し ISFR2017 Young Scientist Prize が贈られました。日本からの受賞者は以下の通りです (プログラム順)。

Kohei Sakai	(Kanazawa Institute of Technology)
Aya Tominaga	(Fukuoka University)
Nobuya Sugaya	(Yamagata University)
Daisuke Yamashita	(Yamagata University)
Natsumi Yamasaki	(Fukuoka University)
Kaede Tejima	(Chubu University)
Naoto Kobayashi	(Chubu University)
Akika Tojo	(Kanazawa Institute of Technology)

最終日にはテクニカルツアーとして、Lower Vítkovice 地区にある Vítkovice Iron and Steel Works の休止高炉設備 (通称 Bolt Tower) を見学しました。高炉の中をゆっくりと見学できる機会は貴重であることから、多くの参加者が集まりました。

本国際会議が大成功に終わりましたのは、Chairman であるオストラバ工科大学の Tomáš Čermák 教授、Bohumír Strnadel 教授、および Stanislav Honus 氏を始めとする関係者皆様のご尽力の成果であり、心より御礼申し上げます。

The program of 9th International Symposium on Feedstock Recycling of Polymeric Materials

MONDAY 10, JULY 2017

8:00 - 9:00	Registration at VŠB – Technical University of Ostrava (Building NA)
9:00 - 9:45	Conference Opening Manager of Centre ENET and Rector emeritus, VŠB – TU Ostrava, Prof. Dr. Tomáš Čermák Vice-Rector for science and research, VŠB – TU Ostrava Prof. Dr. Petr Praus Dean of Faculty of Mechanical Engineering, VŠB – TU Ostrava, Assoc. Prof. Dr. Ivo Hlavatý Director of Centre ENET, VŠB – TU Ostrava, Prof. Dr. Stanislav Míšák Director of Centre for Advanced and Innovative Technologies, VŠB – TU Ostrava, Prof. Dr. Bohumír Strnadel Vice-President of Research Association for Feedstock Recycling of Plastics, Japan, Prof. Dr. Akio Kamimura
9:45 - 10:30	Keynote Lecture (Chairman: T. Čermák) Recycling of natural polymers Wales, K. Kolomazník
10:30 - 11:00	Coffee Break
11:00 - 12:40	Session 1: Recycling of polymers (Chairman: B. Strnadel)
11:00 - 11:20	“Sink or float” - Density separation of post-consumer plastics for feedstock recycling, Markus Bauer, Markus Lehner, Daniel Schwabl, Helmut Flachberger, Lukas Kranzinger, Roland Pomberger, Wolfg. Hofer
11:20 - 11:40	Influence of interfacial adhesion between recycled carbon fiber and resin by different recycling processes, Yuichi Tominaga, Daisuke Shimamoto, Yuji Hotta
11:40 - 12:00	Optimization of a thermochemical process to increase metal-recycling from WEEE, Peter Hense, Jonathan Aigner, Matthias Franke, Katharina Reh, Andreas Hornung
12:00 - 12:20	The damage evaluation of recycle carbon fiber from CFRP made with epoxy resin, Toshihira Irisawa, Kento Ujihara, Reika Aratake, Sarasa Kobayashi, Yohsuke Fujiyasu, Shunsuke Ueda, Hiroshi Kawazoe, Yasuhiro Tanabe
12:20 - 12:40	Sustainable recycling of polyurethanes by means of green glycerol, Diego Simón Herrero, Ana María Borreguero Simón, Antonio de Lucas Martínez and Juan Francisco Rodríguez Romero
12:40 - 14:00	Lunch Break
14:00 - 15:00	Session 2: Biomass and solid waste (Chairman: M. Olazar)
14:00 - 14:20	Conversion of waste plastics into porous carbon nanosheets via a template carbonization method, Jie Liu, Jiali Ma, Lipeng Zhang, Yanliang Wen, Jiang Gong, Tao Tang
14:20 - 14:40	Activated carbons from waste biomass for phenolic compounds removal from water, Ewa Lorenc-Grabowska, Piotr Rutkowski
14:40 - 15:00	Chemical recycling of plastic wastes in high temperature fluids, Hideyuki Tagaya, Nozomi Sakuma, Takuya Takahashi, Taichi Sugeno
15:00 - 16:00	Coffee Break
16:00 - 17:00	Session 3: Poster Session (Chairman: P. Kolat) Flash Presentations of 20 posters 2–3 min each
17:00 - 20:00	Welcome Party Poster discussion and others...

TUESDAY 11, JULY 2017

8:00 - 9:00	Registration at VŠB – Technical University of Ostrava (Building NA)
9:00 - 9:45	Keynote Lecture (Chairman: J. Zajíc) Is ionic liquids good solvent to convert polymeric materials? A. Kamimura
9:45 - 10:25	Session 4: Catalytic processes I (Chairman: J. Zajíc)
9:45 - 10:05	Thermal decomposition of municipal solid waste using different catalysts, Zoltán Sebestyén, Emma Jakab, Norbert Miskolczi, Eszter Barta-Rajnai, Bhaskar Thallada, Zsuzsanna Czégény
10:05 - 10:25	High value carbon nanotubes and hydrogen rich gas produced from waste tyres by pyrolysis catalytic gasification, Yeshui Zhang, Chunfei Wu, Mohamad A. Nahil, Paul T. Williams
10:25 - 11:00	Coffee Break
11:00 - 12:00	Session 5: Catalytic processes II (Chairman: M. Bauer)

- 11:00 - 11:20 H₂-rich syngas recovery and toxic HCN removal from N-containing plastics using Ni catalysts, **Shogo Kumagai**, *Tomoyuki Hosaka, Tomohito Kameda, Toshiaki Yoshioka*
- 11:20 - 11:40 Application and Characterization of Iron and Steel Making Slag to Catalytic Liquefaction Process of Waste Plastics, **Haruki Tani**, *Yuto Kurono, Masahiro Hirasawa, Masao Yukumoto*
- 11:40 - 12:00 Catalytic co-pyrolysis of biomass and polymer waste as a pathway towards improved bio-oil production, **Andrew C. Dyer**, *P. Williams, M. Nahil*
- 12:00 - 13:30 **Lunch Break**
- 13:30 - 14:15 **Keynote Lecture (Chairman: T. Yoshioka)**
Valorization of waste plastics by pyrolysis and in-line upgrading of volatiles, **M. Olazar**, *M. Artetxe, I. Barbarias, M. Amutio, G. Lopez and J. Bilbao*
- 14:15 - 14:55 **Session 6: Pyrolysis, gasification and other processes I (Chairman: P. Kolat)**
- 14:15 - 14:35 Gasification of sawdust in a two-stage gasifier with a coal-based activated carbon and an activated carbon filter, **Ji-Ho Ko**, *Young-Kon Choi, Joo-Sik Kim*
- 14:35 - 14:55 A kinetic lumping approach for solvent-based LDPE cracking, **Teresa Schubert**, *Markus Lehner, Wolfgang Hofer*
- 14:55 - 16:00 **Coffee Break**
- 16:00 - 17:20 **Session 7: Pyrolysis, gasification and other processes II (Chairman: H. Yasuda)**
- 16:00 - 16:20 Physical regeneration method of recycle plastics, **Aya Tominaga**, *Nozomi Takenaka, Natsumi Yamasaki, Ryoko Nakano, Hiroshi Sekiguchi, Eiichi Tanatori, Shigeru Yao*
- 16:20 - 16:40 Pyrolysis of plastic waste in tubular reactor using modified zeolite catalysts producing valuable products, **N. Miskolczi**, *J. Sója, L. Gombor*,
- 16:40 - 17:00 Use of microturbines for cogeneration of energy using biogas, **Jiří Mika**, *Sylva Kyselová*
- 17:00 - 18:30 **Banquet**
- WEDNESDAY 12, JULY 2017**
- 10:45 - 15:30 **Technical Tour**
- 19:30 **Gala Dinner (Final conference speech: T. Čermák)**
- THURSDAY 13, JULY 2017**
- 10:00 - 11:40 **Young researcher section (Additional section)**
- 10:00 - 10:20 Issue of shock compression and expansion by compressors, **Zdeněk Šmída**
- 10:20 - 10:40 Decreasing energy dissipation in the process of storing of two liquids with different temperatures, **Ondřej Štukavec**
- 10:40 - 11:00 Research of biochar properties, **Helena Hladká**
- 11:00 - 11:20 Preparation of sorbents from the tar deposits, **Adrian Pryszcz**
- 11:20 - 11:40 Reduction of Hg emissions from fossil fuel combustion, **Zuzana Vávrová**
- 11:40 **Lunch**

POSTER PROGRAM (July 10)

- Study on solidification / molding technology of seedling soil for cell molding using biomass-derived polymer
Kohei Sakai, *Takayuki Tsukegi, Yukito Fuji, Norio Nagasawa, Yoshihiko Usui, Tomomi Ozawa, Osamu Yoshimura*
- Relationship between the inner structure and the mechanical properties of recycled plastic, **Aya Tominaga**, *Hiroshi Sekiguchi, Ryoko Nakano, Shigeru Yao, Eiichi Takatori*
- Dehydrochlorination of PVC with Subcritical Water, **Naohisa Yanagihara**, *Yusuke Kashiwakura, Yoshiki Satoh, Kousuke Takeuchi, and Tomoya Kumakura*
- Tailoring of porous texture of polyfurfuryl alcohol based activated carbons and its ability to adsorb, **Ewa Lorenc-Grabowska**, *Piotr Rutkowski*
- Air gasification of dried sewage sludge in a three-stage gasifier without electrostatic precipitator, **Young-Kon Choi**, *Ji-Ho Ko, Seung-Jin Oh*
- Study on interfacial shear strength of recycled CF / PP with iPP-PAA, **Takayuki Tsukegi**, *Keisuke Sakakibara, Kouhei Sakai, Osamu Yoshimura, Kiyoshi Uzawa, Daisuke Sasaki*
- The Industrial Recycling of Laminated Film Wastes Containing Al, **Nobuya Sugaya**, *Mayuko Ishita, Hideyuki Tagaya*
- The Effects of Solvent on the De Composition of Polymeric Materials, **Daisuke Yamashita**, *Kazuki Usui, Takuya Takahashi and Hideyuki Tagaya*
- Pyrolysis of PVC in a continuous two-stage pyrolysis process: Effects of temperatures and additives, *Oh Seung-Jin, Park Ki-Bum, Choi Gyung-Goo, Kim Joo-sik*
- Advanced recycle process of waste container and packaging plastic, **Natsumi Yamasaki**, *Aya Tominaga, Misako Nakamura, Ryoko Nakano, Hiroshi Sekiguchi, Eiichi Takatori, Shigeru Yao*

Catalytic liquefaction process of waste plastic using granulated blast furnace slag, **Kaede Tejima**, *Kaori Teramachi, Masao Yukumoto, Haruki Tani*
 Hydrothermal carbons from waste biomass, **Ewa Lorenc-Grabowska**, *Piotr Rutkowski*,
 Design and fluid simulation of a sink float separation tank for mechanical recycling using waste plastics, **Masao Yukumoto**, *Kaede Tejima And Hisatoku Hirate*
 Calorimetric analysis of oil extracted residues of microalgae *desmodesmus sp.*, **Naoto Kobayashi**, *Masao Yukumoto*
 Characterization of the solid residues of a hydrothermally treated *Azolla* biomass, **Bence Babinszki**, *Emma Jakab, Eszter Barta-Rajnai, Zoltán Sebestyén, Bhaskar Thallada, Jitendra Kumar, Zsuzsanna Czégény*
 Upgrading of Pyrolysis Vapours from the Recycling of Carbon Fibre Composites Waste Coming from The Aerospace Industry, **N. Gastelu**, *A. López-Urionabarrenechea, E. Acha, C. Martínez and I. de Marco*
 Effects of functional groups and higher-order structure of polymers on sensibility "Kansei", **Akika Tojo**, *Nobuyuki Watanabe, Ikuhiro Tanida, Satoshi Osawa*
 Study of Sulphate Ion Concentration Changes in a Closed Cooling System of Power Plant, *P. Regucki, Z. Szeliga, R. Krzyżyńska*
 Valorisation of mixed plastics by two-step pyrolysis-reforming process, **I. Barbarias**, *G. López, M. Amutio, M. Artetxe, L. Santamaria, M. Cortazar and M. Olazar*
 Hydrogen production from biomass pyrolysis and in line catalytic steam reforming: Effect of CEO_2 Addition on $\text{Ni}/\text{Al}_2\text{O}_3$ Catalyst, **L. Santamaria**, *A. Arregi, J. Alvarez, M. Artetxe, M. Amutio, G. Lopez, and M. Olazar*



発表会場:オーストラリア工科大学



Keynote: Olazar教授



Keynote: Kolomaznik教授



テクニカルツアー Bolt Tower



Chairman: Tomáš Čermák教授



Keynote: 上村教授



ポスター:フラッシュプレゼンテーション