International Symposium on Carbon and Materials 2020

February 27 to 29, 2020

This symposium is organized by the committee of International Symposium on Carbon and Materials 2020. This symposium is co-organized by Polymer · Hybrid Materials Research Center (PHyM), Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Nano-Macro Materials, Devices and System Research Alliance and by Network Joint Research Center for Materials and Devices.

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Venue:
(February 27-28, Oral session 1-2) Large lecture room at 1st floor of South Multidisciplinary Research Laboratory building 2, Katahira campus, Tohoku University, Sendai, Japan
(February 29, Oral session 3) Large lecture room at 2nd floor of IMRAM East Building 2, Katahira campus, Tohoku University, Sendai, Japan

Attending fee: Free
This symposium does not provide free meals.
Please buy a ticket (4,000 JPY) at the registration desk for joining the welcome party at the evening of February 27.
Coal tar is a highly viscous liquid obtained as a by-product of coal carbonization, consisting mainly of complex mixtures of polycyclic aromatic hydrocarbons (including sulfur- and nitrogen-containing heterocycles) and phenolic compounds. Separation of coal tar into different fractions by distillation affords high-value products. Thus, naphthalene, anthracene oil or pitch are widely employed in, e.g., the manufacturing of polymers, dyes and resins (naphthalene), the synthesis of carbon black for use as a pigment or tire reinforcement (anthracene oil), or the production of carbon fibers for plastic reinforcement and synthetic graphites to be employed as electrodes in the steel and aluminum industries (pitch).

In addition to these fractions, a number of liquids are also produced from coal tar distillation, including creosotes, light oils, phenolic oils and wash oils, as well as several rejects or by-products obtained from the purification of higher-value fractions such as naphthalene oils. Although some of the mentioned liquids have found a few practical uses, high-end applications for such liquids and rejects have been generally lacking. Some of these liquids and rejects are enriched in certain aromatic compounds and/or heterocycles with a potential to be exploited towards valuable applications.

Therefore, the aim of this work was to investigate the use of a number of coal-derived liquids and rejects as precursors for the synthesis of ordered mesoporous carbons and carbon gels, including the exploration of innovative solutions to make the most of the multi-component nature of these products, as well as their potential use in energy- and environment-related applications.

The investigation was carried out in collaboration with partners from the European industrial stakeholders at both ends of the value chain, from the producer of coal tar-derived products to the commercial porous carbon distributer. The preparation, characterization and evaluation of the porous carbon materials was realized by partners from different European research centers and universities.

The obtained ordered mesoporous carbons and carbon gels showed good performance as electrodes for electrochemical energy storage devices, CO₂ capture by adsorption and water remediation.

Acknowledgments
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