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Preface

Preface to the special issue on "Clean Energy and Advanced Carbon Materials (CEAM) 2018"

Carbon-based energy and resources such as coal, oil, gas, biomass, shale oil/gas and combustible ice will continue to play a critical role in the world's energy security. More than 80% of the world's energy is currently supplied by carbon-based sources and while many countries have achieved a diverse energy mix, more options and innovative solutions which reduce carbon emissions on a large scale are needed to lessen the environmental impacts of carbon-based energy production.

In this regard, the 2018 International Symposium on Clean Energy and Advanced Materials (CEAM2018) aimed to bring together leading academic scientists, researchers and scholars from a number of universities, research institutes and industries in Australia, China and Korea to collaboratively discuss solutions to issues associated with carbon-based energy and advanced carbon materials. The symposium was held on 13th–15th August 2018, and sponsored by the International Collaborative Centre for Carbon Futures at the Newcastle Institute for Energy and Resources (NIER), University of Newcastle. In particular, the attendees were encouraged to exchange and share their experiences and research results on all aspects of the following research themes: coal and biomass pyrolysis, gasification and combustion; coal and biomass to fine chemicals; carbon capture and utilization; hybridization technology for coal power generation; metallurgical coke production; advanced carbon materials; low carbon economy sustainability; energy storage technology; and gas treatment and smog control.

There were 7 keynote lectures, 26 oral presentations and 21 posters presented at the symposium. Following the symposium, selected manuscripts covering most aspects of the symposium topics were submitted to this special issue of Fuel Processing Technology, all of which were peer-reviewed, with 8 being accepted for publication. On coal coking and coal pyrolysis, Shi et al. [1] investigated the behaviour of coking coals and the formation of stable radicals during the thermal reaction of an atmospheric residue. Lee et al. [2] reported on their in-situ studies on the plastic layers during the coking of six Australian coking coals using a laboratory-scale coke oven. Xie et al. [3] reported on the influences of large sized inertinite particles on the thermo-swelling, permeability, and volatile release of coking coals during heating. Tran et al. [4] studied the molecular changes in coal maceral concentrates prepared under dimensional heating conditions. Xie et al. [5] investigated the selective cleavage of C—O bonds in benzyl phenyl ether over Pd/AC at room temperature. On advanced materials, Ma et al. [6] reported on the rapid synthesis of magnetic zeolite materials from fly ash and iron-containing wastes using supercritical water and that the materials can be used for the removal of elemental mercury from flue gas. On carbon capture, Ji et al. [7] investigated the effects of fly ash properties on the carbonation efficiency in CO_2 mineralisation. Yu et al. [8] reported on their research on the integration of two CO_2 capture methods, a diamine solvent based absorption and coal fly ash based mineralisation, which proved to be an approach with significant energy savings as an alternative to the traditional CO_2 capture.

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