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micro-CT analysis of metallurgical coke

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Coal is a highly complex and heterogeneous material. Certain coals will convert to coke when heated in the absence of oxygen. Coke, which is a high strength reducing agent, is required for conversion of iron ore into molten iron in a blast furnace. As such, it is a key element in the steelmaking process. Annual exports of Australian coking coals amount to around A$20b. Our research has extensively utilised the Imaging and Medical Beamline at the Australian Synchrotron to obtain micro-CT images which accurately map the microstructure of different coke samples. We use these images to relate the coke microstructure to its strength and reactivity properties, which account for its quality. Insights from the work assist in identifying new ways to improve the quality of coke made from a particular coal, or blend of coals, as well as identifying ways that models used to predict coke strength can be improved. Our research demonstrates the value of micro-CT imaging at the Australian Synchrotron as a research tool in cokemaking, helping to keep Australia at the forefront of innovation in this field as well as to maintain and extend the value of Australia's metallurgical coal resources.

Keywords or phrases (comma separated)

metallurgical coal, coke, micro-CT, IMBL

Are you a student?

No

Do you wish to take part in</br>the Student Poster Slam?

No

Are you an ECR? (<5 yrs</br>since PhD/Masters)

No

What is your gender?

Male

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