IMPACT OF COKING CONDITIONS ON CSR

*P. A. Bennett, M. Wimalaratne

ALS Coal,
478 Freeman Rd. Richlands Queensland 4077 Australia

Abstract:
Coking procedure is one of the main contributors to the quality of the resultant coke and therefore will influence the Coke Strength after Reaction (CSR) of the coke. Laboratories worldwide use their own devised methodology for coke making, which is cause for concern since CSR results cannot be compared without an indication of the error or discrepancy due to the coking procedure. Therefore, there is a need for the coal industry to understand the implications of coking conditions on potential differences in coke quality when using different bench or pilot scale methods to produce coke for testing.

ALS Coal undertook a research project to examine the influence of coking conditions for the Australian coal industry. In this project three Australian coals were selected based on their differences in rank, these were a high volatile soft coking coal, typical prime hard coking coal and a low volatile semi hard coking coal. The coals were coked in ALS Coal’s small scale coke oven using the ALS Coal standard conditions, which has a high heating rate and 0.5 hour of soak time at a centre temperature of 950°C. The coals were also coked at two lower heating rates to a centre temperature of 950°C and at each of these heating rates the soak time was 0 and 1 hour. Previous reports have suggested that variation in heating rate and soak time can cause differences in coke structure and coke texture, and will therefore affect coke quality.

The resultant coke was stabilised using a modified Micum test. The stabilized coke was tested in an I drum, which is the same drum test used for the CSR determination, and the porosity of the coke was determined. The NSC Reactivity test was conducted on the stabilised coke to determine the Coke Reactivity Index (CRI) and CSR.

The project showed that coking conditions do have an impact on CSR and the extent that different coking conditions influence CSR depends on the rank and type of coal. This paper details the findings of this project.

Keywords: coking coal, CRI, CSR, coking conditions

Acknowledgement: The research project was funded under the Australian Coal Association Research Program (ACARP).

* Corresponding author:
e-mail: Philip.Bennett@alsglobal.com  Tel: +61 412057434