

Evaluation of the Extraction and Swelling of Colombian Coals

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ABSTRACT

In this work samples of Colombian coal of the mines of La Loma (Cesar) and Cogua (Cundinamarca) were swollen and extracted with 6 different solvents, to evaluate secondary interactions. The best swelling solvent for La Loma coal was monoethanolamine, MEA, ($Q = 2,6$); other solvents had lower values because of their smaller polarity and basicity. The swelling order for this coal was: Heptane < acetone < methanol < toluene < THF < pyridine < MEA. The differences in the effectiveness of the swelling can be explained based on the solvent interaction with several types of bindings bridges in the coal, as covalent, ionic, hydrogen and charge transfer bindings. For the coal of Cogua as for its residues the best swelling solvent was pyridine, with very low values of Q , below 1,5, indicating that the extraction produces few changes in the intercrossed structure. The results indicate the great crosslinking and complexity of secondary interactions of La Loma coal and the atypicality of the Cogua coal according with its classification and structure, rich in mobile phase. The largest extraction percentage was presented by the coal of Cogua (16%), confirming that this coal presents a smaller crosslinking grade compared with La Loma coal, which showed significantly smaller extraction percentages with all the solvents indicating a larger portion covalently bound. Key words: Coal, extraction, swelling, coke.