EXPERIMENTAL ANALYSIS OF THE LEACHING CHARACTERISTICS OF RESIDUAL HYGAS COAL GASIFICATION SOLIDS

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ABSTRACT

A methodology is presented for assessing the potential for release of elements from solid waste resulting from gasification of coal. The solid waste evaluated in this project was Hygas (Steam, Oxygen Process) Pilot Plant Western coal char formed at approximately 63% carbon conversion. The char was subjected to both batch and continuous flow leach tests under a variety of simulated model water types and environmental conditions. Leachates were analysed for twenty-five elements.

It is apparent that some trace elements were extracted in potentially environmentally significant quantities in every test and that these elements should be monitored closely in future environmental assessment studies on coal conversion process solid wastes.

Most of the effort in the investigation was devoted to quantifying the extend and rate of release of trace elements from the char when leached with eluants of varying qualities. Careful attention was also given to document process operating conditions at the time the char was sampled, and to assure that the char was collected in appropriate fashion. Certain Laboratory tests were also carried out in order to characterise the physical properties of the char, hoping that such a knowledge could be of use in considering alternative methods of disposal.