

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

A Dissertation

submitted to the Department of  
Civil Engineering, Carnegie-Mellon University  
in partial fulfilment of the requirements for  
the award of the degree of

Master of Science

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October 1978

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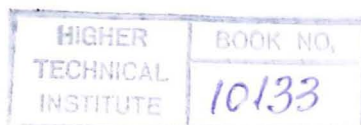
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## ABSTRACT

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 extent 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.

1. Introduction

2. Char Physical Properties

3. Sampling Methodology

4. Surface Area

5. Specific Gravity

6. Dry Ashes

7. Trace Element Analysis

8. Interpretation of Results

9. Conclusions

10. Appendix

11. References