Investigation of Combined SO₂/NO_x Removal by Ceria Sorbents

**Quarterly Report
April 1 - June 30, 1996**

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Work Performed Under Contract No.: DE-PS22-92MT92018

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ABSTRACT

Simultaneous removal of SO_2 and NO_x using a regenerable solid sorbent will constitute an important improvement over the use of separate processes for the removal of these two pollutants from stack gases and possibly eliminate several shortcomings of the individual SO_2 and NO_x removal operations. Recent studies at PETC considered cerium oxide as an alternate sorbent to CuO .

The present study aims to determine the effects of ammonia on the sulfation of the sorbent and to obtain a rate expression for the regeneration of alumina-supported CeO_2 sorbents. In the past quarter the effect of fly-ash, ammonia, and water on the sulfation of the sorbent was investigated. The analysis of the economics of a commercial scale ceria process has been sub-contracted to TECOGEN. This work has been completed and the report has been received.

I. WORK DONE

In this quarter of the project, the main focus was on completion of the experimental program for the determination of the effect of fly-ash, ammonia, and water on the sorbent performance. All the planned experiments have been completed. The analysis and evaluation of the final set of data are being conducted and the results will be reported in the final report. Since the evaluation of the previous data indicated some concern about the accuracy of the metal analyses, a control sample was sent to a different laboratory for confirmation. The results are not received yet.

The report from the subcontractor (TECOGEN of Waltham, MA) for the commercial scale evaluation of the ceria process has been received and reviewed. It will be included in its revised form in the final project report.

FUTURE WORK

In the next quarter, it is planned :

- 1) to write the final report.