

MASS AND HEAT BALANCE FOR COAL GASIFICATION BY ATOMICS INTERNATIONAL'S MOLTEN SALT GASIFICATION PROCESS. Charles A. Trilling,
Atomics International Division, Rockwell International Corporation, 8900 De Soto
Avenue, Canoga Park, CA 91304.

Rockwell International's Atomics International Division is presently developing molten salt processes for the gasification of coal. In these processes the coal is partially oxidized and completely gasified by reaction with air or with oxygen and steam in a bed of molten sodium carbonate. The gasification takes place at temperatures of 1700 to 1800 °F and pressures of 10 to 30 atmospheres. The sulfur and ash of the coal are retained in the melt. A nonpolluting low- or medium-Btu gas is produced which can be used as fuel gas for electric utility or industrial applications or as a synthesis gas for the production of pipeline quality gas, methanol or liquid hydrocarbons. A sidestream of melt is withdrawn from the gasifier and processed in an aqueous regeneration system for removal of ash, recovery of elemental sulfur, and return of the regenerated sodium carbonate to the gasifier.

This report describes the mass and heat balance around the molten salt gasifier and the composition of the fuel gas produced as a function of air-to-coal or oxygen- and steam-to-coal feed ratios and system heat losses. Calculated values are compared with the experimental data obtained in laboratory and small scale pilot plant tests.