DEVELOPMENT OF A PHENOMENOLOGICAL MODEL FOR COAL SLURRY
ATOMIZATION

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PROGRESS SUMMARY

Task 1 - Extensional Viscometer

A contracting flow extensional viscometer was designed and constructed at Adelphi University. Calibration was conducted using a variety of fluids and suspensions.

Task 2 - Testing

Testing using the extensional viscometer was performed using simulated fluids. Testing was performed using coal water slurries with dispersant and/or stabilizer to determine the concentration and shear dependence and the effect of additives. Viscoelastic effects were evaluated using simulated fluids. Testing with coal at three coal concentrations to determine ϕ dependence will begin shortly.

Task 3 - Extension of the Phenomenological Model

The phenomenological model is being extended to include extensional and viscoelastic properties.

Task 4 - Development of Predictive Model for Atomization

A bench scale atomization study is being conducted using simulated fluids and coal water slurries to determine the parameters on which the model is dependent. Based on these results, a model is being developed for the Sauter mean diameter. A statistical analysis of atomization data will relate the PSD to the dimensionless parameters.

ACTIVITIES SCHEDULED FOR THE NEXT QUARTER

Testing and modeling will be completed shortly. A request for a three month no-cost extension of the project has been submitted due to some delays in testing due to equipment problems.