Development of a Phenomenological Model for coal Slurry Atomization

**Quarterly Report
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PROGRESS SUMMARY

Task 1 – Extensional Viscometer

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

Task 2 – Testing

Testing using extensional viscometer was performed using simulated fluids. Additional testing will be performed using coal water slurries with dispersant and/or stabilizer to determine the concentration and shear dependence and the effect of additives. Viscoelastic effects will also be evaluated as a function of three coal concentrations for each coal water slurry in order to determine ϕ dependence. Testing has begun and is continuing.

Task 3 – Extension of the Phenomenological Model

The phenomenological model is in the process of 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 the atomization data will relate the PSD to the dimensionless parameters.

ACTIVITIES SCHEDULED FOR THE NEXT QUARTER

All testing and modeling will be completed in the next quarter. In the last two months of the project, the final report will be prepared.