Project

Improvement of data acquisition and control system for thermo balance

Supervisor: David Agar

Task: The thermo balance is currently used in biofuel pyrolysis and combustion research in the Department of Physical Chemistry. Using the device fuel samples can be heated (with user-defined temperature profiles) up to approximately 800 ºC in air or nitrogen atmosphere. Data of interest includes: temperature values, sample mass, time derivative of sample mass and mass-flow of working gases. The present system hardware includes: thermocouples, two mass-flow controllers, an electronic balance and a voltage converter whose output regulates electrical current to a heating element.

The data acquisition and control system currently functions but has some critical problems which need to corrected and/or improved in order to gather useful experimental data. This will involve analysis of existing LabView code, identifying needed control algorithms, assessing filtering methods and possibly installation of new hardware components. It is important that the thermo balance and existing measurement system remain available for use during the improvement process.