

## CALORIMETER TESTING SERVICES - C80

Kinetica, Inc. offers a commercial sample testing service utilizing a Setaram C80 calorimeter (C80).

The C80 is a heat flow calorimeter in which the temperature is a parameter controlled by the operator. The temperature is generated by a thermostated calorimetric block which surrounds twin detectors and a pair of matched cells. One cell functions as the sample holder; the other serves as a reference. External temperature perturbations in the calorimetric block are eliminated by a differential coupling of the sample and reference detectors.

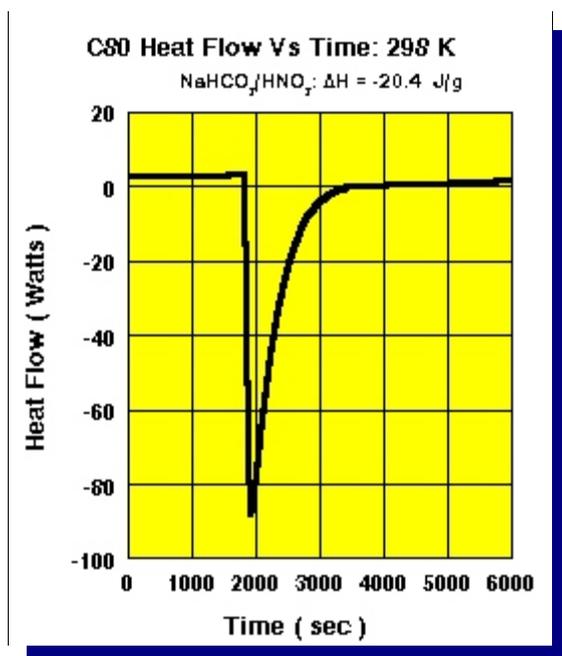
The C80 is operated as an isothermal calorimeter or as a temperature scanning calorimeter. The useful temperature range is ambient to 300 °C; the useable scanning rates lie within the range, 0 - 2 °C min<sup>-1</sup>. A wide variety of sample cells are available to monitor transformations that have industrial significance.

Major applications for the C80 include the following items:

- Catalyst Evaluations
- Dehydration Processes
- Denaturation Processes
- Dissolution Measurements
- Gas Adsorption
- Heat Capacities
- Heats of Reaction
- Heats of Solution
- Hydration Processes
- Microbiological Activity
- Phase Transitions
- Polymerization of Monomers
- Resin Curing Reactions
- Titration Calorimetry
- Wetting Characteristics

An example of raw data for a typical process, the reaction of sodium bicarbonate with excess nitric acid, is shown in the graphic. This data was obtained with the use of a membrane mixing cell. The mixing cell consists of two chambers separated by a membrane. The top chamber contained nitric acid; the bottom chamber

contained sodium bicarbonate. After thermal equilibration in the calorimeter, the membrane was broken and the reactants were mixed with the aid of an internal impeller. The heat flow represents the total heat for mixing and reaction. Integration of the raw heat flow data yields the total reaction enthalpy,  $\Delta H$ .



Typical users of the C80 service are small- and medium-sized companies that have a specialized and possibly a one-time need for calorimetry data for use in process development and optimization.

Contact Kinetica for additional information concerning C80 testing or related services.

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