

Flow microcalorimetry: theory, test reactions and applications.

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Equations that allow the determination of both kinetic and thermodynamic parameters for reacting systems will be presented. The equations, for flow microcalorimetry include a volume term for the reaction chamber – this is the thermal or apparent volume not the physical volume. The imidazole catalysed hydrolysis of triacetin has been proposed [1] as a test reaction for isothermal heat conduction microcalorimeters but is shown to be unsuitable for flow microcalorimeters. Therefore, a secondary test reaction, the base hydrolysis of methyl *p*-hydroxy benzoate is proposed. Use of this reaction allows calibration of the thermal volume as a function of flow rate. Details and conclusions will be discussed. An extension to a novel calorimetric design will also be discussed (Dr R B Kemp, University of Wales, Aberystwyth). Applications of the flow microcalorimeter will be introduced and discussed.

1. A E Beezer et al., The imidazole catalysed hydrolysis of triacetin: an inter- and intra-laboratory development of a test reaction for isothermal heat conduction microcalorimeters used for the determination of both thermodynamic and kinetic parameters. *Thermochim.Acta*, 380 (2001) 13-17.