

## USE OF REACTION CALORIMETRY FOR THE STUDY OF RAPID REDOX INITIATION

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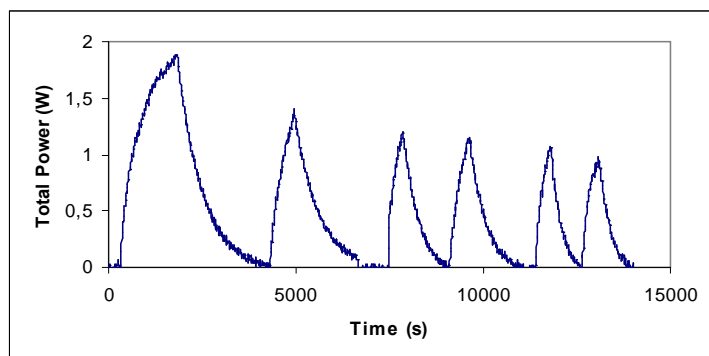
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Rapidly controllable redox initiator systems are frequently used in emulsion polymerisation reactions /1,2/. Reaction calorimetry based on the True Heat Flow principle (THF), can be used for on-line calorimetric and kinetics studies /3,4/ of rapid redox initiations and the optimisation of large-scale production processes.

The experiments were performed with a ChemiSens CPA202 reaction calorimeter, a small-volume, plug & play instrument that requires no calibration and delivers extremely reliable results.

After evacuation, a vanadium(IV)-oxosulphate catalyst was added to the polymerisation mixture under nitrogen pressure. With a precision motor syringe, small quantities of pre-heated t-butyl hydro-peroxide were dosed.

Six experiments were carried out with three different amounts of catalyst. The amount of catalyst was doubled after each two batches. The rate of polymerisation increased linearly with the catalyst concentration. Rate constants of 3201, 5098 and 7697 l mole<sup>-1</sup> s<sup>-1</sup> were measured.



Reaction calorimetry is a powerful means to study the kinetics of chemical reactions without the need to apply sampling techniques. A prerequisite is the application of the unique THF measuring principle that allows fast and calibration free measurements.

References:

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