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Ampoule Microcalorimetry for stability and compatibility testing of Epichlorhydrin Rubber (ECO) gasket when exposed to a hydraulic fluid

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Instrument

LKB 2277 Multi-channel Microcalorimetry System with 4 ampoule calorimeters

Field of application

Industrial material interaction

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Almost all chemical and physical interactions give out, or absorb heat, and are thus in principle detectable by the microcalorimetric technique. The 2277 uses normal gram quantities of material and requires no special preparation.

A 60/40 wt% mixture of ECO ($2 \times 2 \times 2$ mm pieces) and hydraulic fluid yields an endothermic deviation from the calculated non-interaction curve. This effect is identified as swelling of the rubber in the liquid. This

purely physical process is completed after approximately one day, when the system has reached the state of equilibrium swelling. No subsequent interactions are observed, showing that the rubber is not subjected to any long-term chemical degradation in the hydraulic fluid. The weak exotherm from the pure ECO probably includes oxidation and HCl decomposition reactions. The hydraulic fluid curve is very close to zero.

