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# DIFFERENTIAL SCANNING CALORIMETRY (DSC) AT HIGH PRESSURE

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On the basis of a high-pressure apparatus described by M. Kamphausen[1,2,3], a DSC calorimeter for pressures up to 4000 bar and in the temperature range 100 to 300 K was constructed by H. Arntz[4,5,6]. The apparatus has been described in detail elsewhere[4,6].

Recent results obtained by U. Wenzel are presented on the plastic crystal 2-chloro-2-methylpropane at pressures up to 1500 bar. At normal pressure two solid-solid phase transitions of the crystal are known. During the investigations a new pressure-induced solid phase was found at pressures above 800 bar. From the transition enthalpies and the p-T data of the coexistence lines transition entropies and transition volumes can be calculated.

In order to extend the ranges of temperature and pressure to higher values a new high-pressure twin DSC calorimeter was constructed. It works in the temperature range 300 to 600 K and at pressures up to 6000 bar. The pressure is generated by a hand pump and is transmitted by silicon oil. In spite of the similarity of the general set up some principal changes of the apparatus were necessary because of the higher values of temperature and pressure. The pressure vessels are shrinked cylinders made of the nickel alloy Inconel 718. The set up of the calorimeter is given and the procedure of temperature calibration and enthalpy determination described.

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Preliminary results are reported concerning measurements on the plastic crystal diamantane and the high pressure phase of chain extended polyethylene[8]. The hexagonal phase, first reported by Bassett[9], could be confirmed.

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