

CALORIMETRIC INVESTIGATIONS OF SPARINGLY SOLUBLE SUBSTANCES

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A reliable knowledge on the behaviour of sparingly soluble substances in the dissolution process is a necessary requirement for the understanding of various physiological, biochemical and pharmaceutical problems. Salts from calcium, e.g. calcium carbonate or oxalate, are essential constituents of urinary or kidney calculi. They are results of a precipitation or phase transition equilibrium with an endogenous liquid. For the understanding of the different physiological and mineralisation processes consistent thermodynamic data sets for the corresponding systems are necessary .

For the crystalline and amorphous phases of calcium carbonate CaCO_3 as well as for the different hydrates of the oxalate $\text{CaC}_2\text{O}_4 \cdot x\text{H}_2\text{O}$ we investigated the dissolution and phase transition enthalpies calorimetrically and compared our results to data from other equilibrium measurements[1,2]. The agreement of the data sets is satisfying, provided that the investigations are carried out with extensively characterised samples and with calorimeters carefully calibrated for a reliable data deconvolution. A calorimetric screening[3] of the dissolution and of the phase transition process permits interesting investigations of the control and inhibition of the phase formation of the different CaCO_3 polymorphs [4]. For comparison purposes we carried out investigations of CaCO_3 biomineralisation products from the "Octopus" and from the "Red Posthorn" snail.

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[3] F.Baitalow, G.Wolf, H.G. Schmidt : Thermochemica Acta 52 (1998) 5

[4] G. Wolf, C. Günther : J.Thermal.Anal.Cal. 65 (2001) 687