Flash DSC study of the melting behavior of Cytosine

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We report, for the first time, the melting behavior of cytosine, one of the nucleobases, building blocks of DNA and RNA sequences.

Cytosine is known to decompose during the melting process, this makes the application of conventional calorimetric methods meaningless for investigation of the melting of this thermally instable biomolecule.

With the help of Mettler Toledo flash DSC1, the sample of solid cytosine was heated with a scanning rate of 6000 $K \cdot s^{-1}$ above the proposed temperature of fusion. No obvious evidence of cytosine decomposition was observed. Upon quenching, with high cooling rate a partial verification was observed.

Several experiments were carried out in order to get reliable values of fusion temperature, fusion enthalpy, as well as the glass transition temperature and the specific heat capacity of liquid cytosine - reported for the first time.