

## **Contribution of H-bond vibrations to the heat capacity of water**

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The anomalously large value of the heat capacity of liquid water is discussed. Comparing the temperature dependencies of the heat capacities for water with that for argon and hydrogen sulfide we separate the contributions of the translational and rotational degrees of freedom. The residual part is considered as one caused by specific contributions of transversal vibrations of H-bonds. The estimate for the number of H-bonds per molecule, obtained from the analysis of this contribution, is in quite good agreement with similar estimates following from the analysis of the specific volume and heat of evaporation as well as the kinematic shear viscosity.

This work is devoted to the consecutive analysis of different contributions to the heat capacity of liquid water. The main attention is focused on the correct separation of the contributions to  $C_v$  caused by the translational and rotational degrees of freedom. For this purpose the careful comparison of the heat capacities of water and argon and hydrogen sulfide is carried out. The role playing by the thermal excitations of the H-bond network in water is studied.