



**Nominated Conference theme:** Enhancing the transition to tertiary chemistry

## **MAKING FRIENDS WITH THE “BLACK SHEEP” ENTROPY**

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### **Abstract**

The quantity “entropy  $S$ ” is often considered to be especially difficult to grasp, as a kind of “black sheep” among the physicochemical quantities that should preferably be avoided. But it doesn’t have to be this way!

As a simple way to introduce this quantity to first-year students and even pupils without frightening mathematical apparatus, we propose to firstly characterize it by its typical and easily observable properties, i.e., by creating a kind of “wanted poster” for it. This phenomenological description is complemented by a direct measuring procedure, a method which has been common practice for basic concepts such as length, time, or mass for a long time. The proposed approach is elementary, does not require any special previous knowledge, and leads immediately to results that can be utilized practically. In a short time, the students learn for example how to calculate the efficiency of a thermal engine and much more.

In order to support the idea that concepts such as entropy are not abstract and remote from everyday life illustrative but nevertheless easily and safely realizable demonstration experiments are proposed such as measuring the amount of entropy emitted during a reaction with the help of a simple ice calorimeter. Such experiments arouse the students’ interest, improve the understanding and forge links between textbook knowledge and everyday experiences. Selected experiments will be shown as videos or carried out live during the oral presentation.

### **References**

Job, G., Rüffler, R., Physical Chemistry from a Different Angle. Springer, Heidelberg, New York, 2016