

# A review on determining the equilibrium ortho-parahydrogen ratio

*Tuesday 23 July 2024 14:00 (2 hours)*

Exact knowledge of the equilibrium ortho-parahydrogen ratio is of crucial importance for most engineering applications related to liquid hydrogen. It is usually determined using the Boltzmann distribution rooted in statistical thermodynamics. This distribution requires some assumptions regarding the modeling of the rotational energy levels related to the different rotational states of the hydrogen molecule. It was found that the assumptions related to these energy levels reported in literature differ in a way that causes significant deviations. This leads to potentially large problems with accuracy and comparability of calculations and measurement results.

This work presents a review on the calculation of the equilibrium ortho-parahydrogen ratio. A comparison of several reported assumptions and constants is provided, and a reference calculation method is proposed.

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**Session Classification:** Tue-Po-1.6

**Track Classification:** Tracks ICEC 29 Geneva 2024: ICEC 06: Cryogenic applications: hydrogen and LNG systems