Contribution ID: **108** Type: **Contributed Oral**

C2Or3B-05: Ortho-parahydrogen catalyst test facility

Tuesday 11 July 2023 17:15 (15 minutes)

With the growing interest in hydrogen as one pillar of the future energy economy, the relevance of hydrogen liquefaction for storage and transportation is increasing rapidly. However, the liquefaction process still offers much potential for improvement in terms of cost and efficiency. One obstacle on the way to more cost- and energy-efficient liquefiers is the uncertainty associated with the dimensioning of the ortho-para converters. Literature data on the existing ortho-para catalysts stem mainly from the 1950s and 1960s and are partly inconsistent. Therefore, a new facility for the comprehensive investigation of catalytic ortho-parahydrogen conversion was set up at the TU Dresden as part of the government-funded HyCat project. It enables the testing of catalysts in the whole operational range of ortho-para converters in modern large-scale liquefaction plants by allowing the independent variation of temperature, pressure, flow rate, inlet ortho-para ratio, and sample reactor internal geometry. The setup has been tested and validated. It can now be used to produce new high-quality data sets on the performance of the commercial catalyst IONEX (hydrous ferric oxide), for the qualification of alternative catalysts, and for gaining a deeper understanding of the reaction kinetics involved.

Author: Mr EISENHUT, Sebastian (TU Dresden, Professur für Kälte-, Kryo- und Kompressorentechnik)

Co-author: Prof. HABERSTROH, Christoph (TU Dresden, Professur für Kälte-, Kryo- und Kompressorentechnik)

Presenter: Mr EISENHUT, Sebastian (TU Dresden, Professur für Kälte-, Kryo- und Kompressorentechnik)

Session Classification: C2Or3B: Hydrogen III: Liquefaction and Testing