

Research of hydrogen storage in meso-porous large surface area materials for applications in automotive industry

Peteris Lesnicenoks¹, Remo Merijs-Meri², Janis Kleperis³

¹Faculty of Materials Science and Applied Chemistry, Riga Technical University, Latvia

²Institute of Polymer Materials, Faculty of Materials Science and Applied Chemistry, RTU, Latvia

³Institute of Solid State Physics, University of Latvia, Latvia

e-mail: peteris.lesnicenoks@rtu.lv

The best way to approach the storage problem for hydrogen storage, is to know as much as possible about the methods that the industry has picked, and try to counter it with something novel, reliable and safe. Such class of materials is solid state storage. Low pressure storage counters the need of expensive carbon fiber wound containers. The safety comes with hydrogen being bound, and not leaving the material without supply of energy, and reliability comes from the fact that these materials can be refilled, without the need to replace the gas tank and to refill it in a factory. Study of the applicable materials - zeolites and few layer graphene (FLG) is done characterizing the materials, determining the best type of synthesis of these materials and applying the available technologies for hydrogen sorption study.

Specialization for automotive industry has been determined, cause cities not always can support large amount of charging stations, for electric cars, that is why FCEV - fuel cell electric vehicle is the optimal choice, but it needs a compact and powerful range extender setup, where one of the main components is the gas tank.

Participation is supported by ERAF project No. 2015/0014/2DP/2.1.1.2.0/14/APIA/VIAA/010