

Prospecting research of new effective hydrogen accumulating metallic materials in the frames of the IPHE project

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In the frames of the IPHE Project "Reversible solid state hydrogen storage for fuel cell power supply system" Chemistry Department Lomonosov MSU is involved in research and development of new low-temperature hydrogen accumulating alloys and intermetallic compounds on base of titanium, vanadium and rare-earth metals.

Up to now, basing on the analysis of literature a new base of experimental data on hydrogen absorption properties of different types of hydrogen absorbing alloys was developed. Using previously worked up mathematical model of prediction of hydrogen absorbing properties and developed database alloys of Ti-Y-Mn, Ti (Zr)-V-Mn systems, vanadium alloys and neodymium intermetallic compounds of AB₅-type were studied. The best hydrogen content results were obtained for vanadium alloys for which this value approached 2.1 mass.%. However, neodymium intermetallics are most applicable for the purpose of storage and supply of hydrogen because they are characterised by the maximum growth of equilibrium pressure at the preset temperature range.

Further success of investigations is connected with optimisation of previously studied alloys using the mathematical model and also with the search for new non-studied metallic compositions.