# TOPOCHEMISTRY OF INTERACTION BETWEEN ZIRCONIUM FOIL AND ATOMIC HYDROGEN

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According to the literature data, topochemistry of reaction between zirconium and molecular hydrogen correlates well the model of shrinking envelope.

The topochemistry of interaction reaction of atomic hydrogen with zirconium foil have been considered in present paper. It has been demonstrated that this reaction is subject to topochemical model of volume precipitation of interaction product. The similar topochemical effect have been observed for the reactions of hydrogen and rare-earth metals at high temperature and can be explained by the high mobility of hydrogen in metal under these conditions.

In the studied case this effect have been realized at the temperatures optimal for receiving of hydrides in molecular hydrogen at atmospheric pressure. But we have conducted the hydrogenation process in atomic hydrogen at a pressure of 26 Pa.

Using the Mössbauer effect in previous papers authors showed that related conditions of hydrogenation provide a possibility to create the pressure ~ $10^9$ Pa in the specimen bulk. The use of zirconium foil 20-25 μm thick as test specimen allows a decrease of diffusion field size to 12,5 μm as hydrogen penetration takes place at both sides of specimen.

These conditions, as in the case of rare-earth metals, creates the concurrence between the rates of hydrogen diffusion and precipitation of interaction product in metallic matrix. This is favourable for volume precipitation of hydride phase in zirconium.

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