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# P4.118 Reactor studies of hydrogen isotopes interaction with lithium CPS using dynamic sorption technique

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At present, the study of structural and functional materials' properties of fusion reactors is carried out as a part of implementation of ITER and DEMO projects.
The research of liquid metals application possibility as a plasma facing material (PFM) is one of the most important area. Studies carried out on this subject have shown that lithium is a good material for use as a PFM in a fusion reactor. The use of liquid lithium is more attractive, if lithium is enclosed in a capillary-porous system (CPS). Compared to solid PFMs lithium CPS have several advantages: resistance to properties degradation, ability to surface self-repair due to capillary forces both in plasma discharge conditions, plasma breakdowns and in the case of ELMs. An important problem in the "plasma-wall" studies is the investigation of the processes of hydrogen isotopes interaction with lithium CPS under neutron irradiation.
This paper presents the results of hydrogen isotopes interaction with lithium CPS under reactor irradiation at temperatures of the CPS sample from 200 to 800 ℃. A special ampoule device with a tubular sample of lithium CPS was developed for experiments. The IVG.1M reactor (Kurchatov) was used as a source of radiation. The experiments were carried out by the method of dynamic sorption: a constant stream of deuterium was swept through the tube sample with constant degassing and fixation of gas composition in the experimental ampoule device.
The time dependences of gas composition change in the ampoule device during irradiation were recorded at different sample temperatures and deuterium fluxes. The results obtained were compared with non-reactor experiments. The mechanisms of deuterium sorption on the surface of liquid lithium were determined, and the level and composition of the tritium-containing molecules released from lithium were estimated.
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