

Tritium breeder is a most process among controlled fusion reactor engineer problems. Tritium Breeding Ratio (TBR) is a main parameter characterizing of the process. On the whole TBR can be submitted as a ratio of the amount tritium produced in the fusion reactor to the amount of tritium that burned up in the reactor plasma. A concept and block-schema of tritium breeding monitoring and experimental estimation of the tritium-breeding ratio in DEMO and ITER are discussed. Systems for experimental estimation of the TBR and the tritium-breeding dynamic parameters in a Tritium Breeding Modules (TBM) of the ITER are proposed.

The systems are based on tritium and neutron flux measurements under ITER plasma experiments and use lithium ortho-silicate and lithium carbonate and the neutron detectors. Differences isotope lithium-6 and lithium-7 are applied. The detectors are delivered to tritium breeding zone (TBZ) of the TBM on channels connected the TBM and an operating zone of ITER. Pneumatic and mechanic methods are applied to deliver the samples to the TBZ of the TBM and to extract the samples using monitor channels during plasma operational pauses.

Results of the channel parameter calculations and comparison of the pneumatic and mechanic systems are presented in the paper.