Hydrogen Interaction with Stainless Steel 12Cr18Ni10Ti Containing up to 500 appm of Radiogenic ^{3}He

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The main purpose of the presented study consists in investigation of mechanical properties, structural changes and hydrogen isotope interactions with the stainless steel, which have been subjected to accelerated build-up of ^{3}He by "tritium trick" technique. Samples were saturated in tritium to equilibrium concentration at 50MPa and temperatures of up to 800K, thereafter the samples were sharply cooled to room temperature, and stored at this temperature during the time, which was necessary for a build-up of a predetermined concentration of ^{3}He .

The following items will be discussed in this presentation:

- kinetics of ^{3}He thermal release;
- hydrogen isotope transport, trapping, and accumulation in stainless steel 12Cr18Ni10Ti containing radiogenic helium;
- synergistic effects of radiogenic helium and hydrogen upon mechanical properties of stainless steel 12Cr18Ni10Ti at ^{3}He concentration up to 500appm;
- structural changes in stainless steel 12Cr18Ni10Ti saturated up to various concentration of ^{3}He.

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