

"Hydrogen retention in tungsten - from laboratory experiments to ITER"

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The next-step fusion experiment ITER will investigate a burning deuterium-tritium plasma. Both hydrogen isotopes can be retained in plasma-facing materials, and the accumulation of tritium is an important safety concern due to its radioactivity. A decrease of the retained hydrogen inventory by about one order of magnitude could be demonstrated at the tokamak experiment ASDEX Upgrade by replacing all plasma-facing components made from carbon by tungsten. Laboratory experiments on hydrogen retention in tungsten allow a detailed understanding of the physics of hydrogen behavior in tungsten. The combination of laboratory and tokamak data allows a reliable extrapolation to hydrogen retention in ITER, which can be significantly reduced by using tungsten.