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Wall Conditioning Characterization in NSTX-U[1] D. CARON, PPPL(SULI), V. SOUKHANOVSKII, F. SCOTTI, M. WELLER, LLNL — Impurities in tokamak plasmas can lead to disruptive instabilities due to radiative energy loss which impede access to high-confinements mode. One source of impurities in NSTX-U are water molecules trapped in graphite plasma facing components (PFCs), which make up the walls and divertors. Hydrogen and oxygen impurities are released into the plasma due to plasma surface interactions. Extreme ultraviolet (EUV) and visible spectrometers are used in conjunction with a residual gas analyzer (RGA) to characterize the source and amount of released impurities. A high resolution visible spectrometer measured H/D Balmer-α intensity ratio on the inner wall, the upper and lower divertors, and provided a hydrogen time history for shot-to-shot trends. The RGA provided partial pressure trends of masses 2 (H_2), 16 (O_2), and 18 (H_2O). Trends of O VIII and C VI spectral line intensities from the core plasma were obtained from the EUV spectrometer. The trends are correlated with wall conditioning, namely helium glow discharge cleaning and boronization. Using these trends, impurity content monitoring and recommendations for wall conditioning can be implemented.

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