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**SSPX discharges with tungsten hexacarbonyl prefill** J. CLEMENTSON, P. BEIERSDORFER, H.S. MCLEAN, R.D. WOOD, E.W. MAGEE, Lawrence Livermore National Laboratory — The ITER tokamak will have a tungsten divertor and, consequently, the plasmas are expected to contain tungsten ions. The spectral emission from these ions can serve to diagnose the divertor for plasma parameters such as tungsten concentrations, densities, ion and electron temperatures, and flow velocities. The ITER divertor plasmas will have densities around  $10^{14-15} \text{ cm}^{-3}$  and temperatures below 100 eV. These conditions are similar to the plasmas at the Sustained Spheromak Physics Experiment (SSPX) in Livermore. To simulate ITER divertor plasmas, a tungsten impurity was introduced into the SSPX spheromak by prefilling it with tungsten hexacarbonyl at injection pressures up to 1 Torr prior to the usual hydrogen gas injection and initiation of the plasma discharge. These discharges lasted a few milliseconds and achieved plasma currents up to 1 MA. The possibility of using the emission from low charge state tungsten ions to diagnose tokamak plasmas was investigated using a high-resolution EUV spectrometer in the 50 to 450 Å range. Work performed under the auspices of the US DOE by LLNL under contract DE-AC52-07NA-27344.

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