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**Design of an Operando Positron Annihilation Gamma Spectrometer (OPAGS)**[1] S. SATYAL, P. JOGLEKAR, S. KALASKAR, K. SHASTRY, A.H. WEISS, UT Arlington — Surface properties measured under UHV conditions cannot be extended to surfaces interacting with gases under realistic pressures due to surface reconstruction and other strong perturbations of the surface. We present the design of an Operando Positron Annihilation Gamma Spectrometer (OPAGS) currently under construction at the University of Texas at Arlington. This new system will enable us to probe the surface and gather defect specific chemical and charge state information from surfaces under realistic pressures. Differential pumping will be used to maintain the sample in a gas environment while the rest of the beam is maintained under UHV. The Elemental content of the surface interacting with the gas environment will be determined from the Doppler broadened gamma spectra. This system will include a time of flight (TOF) positron annihilation induced Auger spectrometer (TOF-PAES) which correlates with the Doppler measurements at lower pressures. These new technique help to understand the charge transfer mechanisms at the surface.

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