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O-atom Recombination on Anodized Aluminum in an Oxygen Plasma, Studied by a New "Spinning Wall" Technique. VINCENT M. DONNELLY, PETER KURUNCZI, JOYDEEP GUHA, University of Houston — We have developed a new method for studying plasma-surface interactions. A cylinder coated with the material of interest (here, anodized Al) is embedded in the plasma chamber wall. Skimmers and differential pumping allow the plasma chamber to be operated at standard pressures (e.g. 10 mTorr) while the chamber on the opposite side of the cylinder is at high or ultrahigh vacuum, allowing the surface to be studied by line-of-sight mass spectrometer or Auger electron spectroscopy. When the sample is rotated at up to 200,000 rpm, the surface can be examined in as little as 0.2 ms after exposure to the plasma. By varying the rotation frequency the reaction time can be varied, thus allowing the kinetics of atom-surface interactions to be extracted. O_2 is observed to desorb when the surface is exposed to an oxygen plasma, due to heterogeneous recombination of O. The signal falls off rapidly as a function of decreasing rotation frequency at high frequency, and much more slowly at lower frequencies. This time dependence can be well represented by a multi-site adsorption model with mobile O diffusing from site to vacant site. Supported by ACS/PRF.

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