Molecular Photoelectron Spectroscopy: A Handbook of He 584 Ã… Spectra #9780471893202 #David Warren Turner, C. Baker, A. D. Baker, C. R. Brundle #Wiley Interscience, 1970 #1970

The photoelectron spectroscopy discussed in this book is based on photoionization brought about by radiation in the far ultra12, in the 1960s violet region of the spectrum. It was.invented early 3 groups, one led by T u r n4e r in London, the independently by two other by Vilesov in Leningrad.Â Main features of photoelectron spectra. In a photoelectron spectrometer, an intense beam of monochromatic (monoenergetic) ultraviolet light ionizes molecules or atoms of a gas in an ionization chamber: M + Av^M.001 + e. (1.2). The light used is most commonly the helium resonance line H e I at 584 A (58.4 nm), which is equivalent to 21.22 electronvolts (eV) of energy per photon. Photoelectron spectroscopy and ionization energy measurements provide direct evidence for the electronic structure of atoms. Concepts â€¢ Photoelectric effect â€¢ Planckâ€™s law â€¢ Quantum theory â€¢ Coulombâ€™s law â€¢ Ionization energy â€¢ Photoelectron spectroscopy â€¢ Electronic structure â€¢ Atomic orbitals Background Photoelectron spectroscopy is defined as the measurement of the relative number of electrons of different energies that are ejected from atoms when they are bombarded with high-energy electromagnetic radiation.Â A photoelectron spectrophotometer consists of three basic parts: a vacuum chamber for the sample, a radiation or light source, and an electron analyzer to separate electrons based on their kinetic energies (Figure 1). â€“ Photoelectron spectroscopy (PES) is a technique used for determining the ionization potentials of molecules. Underneath the banner of PES are two separate techniques for quantitative and qualitative â€¦Â The radiation source for UPS is a gas discharge lamp, with the typical one being an He discharge lamp operating at 58.4 nm which corresponds to 21.2 eV of kinetic energy. XPS has a choice between a monocrhomatic beam of a few microns or an unfocused non-monochromatic beam of a couple centimeters.Â The source is what sets the kinetic energy of the photoelectrons, so there needs to not only be enough energy present to cause the ionizations, but there must also be an analyzer capable of measuring the kinetic energy of the released photoelectrons.