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ULTRAVIOLET

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Abstract: The optics-free spectrometer is a photon spectrometer. It provides the photon spectrum of a broadband source by converting energy E into electrons of energy E' , according to the Einstein relation, $E' = E - E(i)$. $E(i)$ is the ionization threshold of the gas target of interest (any of the rare gases are suitable) and E is the incoming photon energy. As is evident from the above equation, only a single order spectrum is produced throughout the energy range between the first and second ionization potentials of the rare gas used. Photons with energy above the second ionization potential produce two groups of electrons, but they are readily distinguished from each other. This feature makes this device extremely useful for determining the true spectrum of a continuum source or a many line source. The principle of operation and the laboratory results obtained with a representative configuration of the optics-free spectrometer are presented.

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