



# PHOTOELECTRON SPECTROSCOPY

Gas Detection For Life

Model AC-2



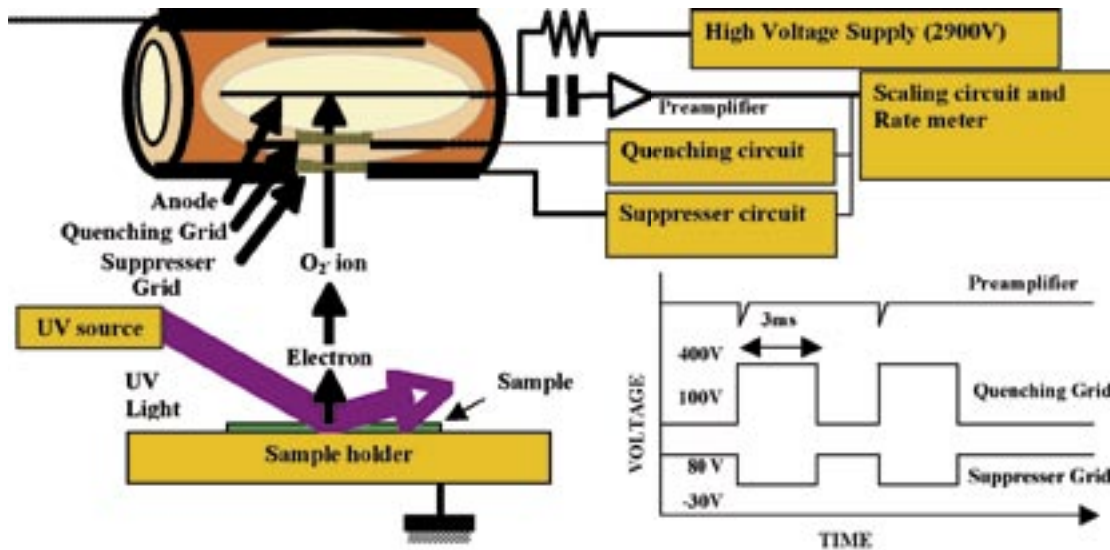
## Features

- Atmospheric pressure operation (unique in the world)
- Estimate work function, ionization potential, density of states (DOS)
- Measure thickness of thin films on the material surface (less than 20 nano-meters)
- Energy selectable UV source
- Low photo - excitation energy (3.40 - 6.20eV)
- Compact desktop type
- Easy sample introduction and removal
- Full computer control

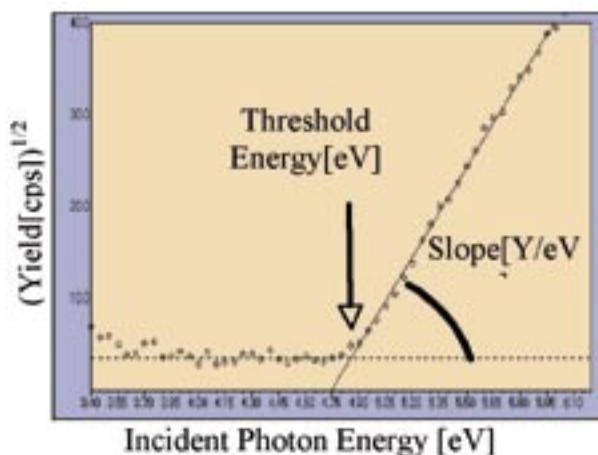
**The Model AC-2 is an instrument for Photoelectron Spectroscopy at atmospheric pressure that is an open counter equipped with an UV source.**

The open counter is a unique electron detector, which can be operated in open air, and has been used for photoelectron spectroscopy in the air (PESA). By combining the open counter with an UV source, the AC-2 PESA instrument opens the way to a new dimension in surface analysis.

The model AC-2 has been developed from proven technology and incorporates the latest in digital control electronics producing an easy to use, flexible system suitable for all levels of expertise.



The schematic diagram of the Open counter and waveforms at quenching grid, suppresser grid and the preamplifier out put



Typical Photoelectron Spectrum

If the test sample is a metal, the relationship between the photon energy and the square root of yield is a linear line. But if the test sample is a semiconductor, the cube root of yield gives a linear line. The crossing point of the back ground and the yield line is a photoemission threshold energy, also called the work function or the ionization potential.

### Work functions of several metals

“In Air” means the work functions estimated from the photoelectron spectrum by using the AC-2 to test the surface in the air. “In UHV” means the work functions of the surfaces tested in the ultra high vacuum. Some of them have big differences, because the surfaces of metals in the air are covered with oxide films.

	In Air <sup>1</sup>	In UHV <sup>2</sup>
Fe	4.35 [eV]	4.50 [eV]
Ni	4.25 [eV]	5.15 [eV]
Cu	4.45 [eV]	4.65 [eV]
Al	3.60 [eV]	4.20 [eV]
Zn	3.80 [eV]	-
Au	4.78 [eV]	5.10 [eV]

1) M. Uda ; Jpn. J.Appl.Phys. 24,284 (1985)

2) D.E. Eastman ; Phys.Rev. B2, 1 (1970)

\* Specifications subject to change without notice.



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