SECTION E

A NEW HIGH TEMPERATURE GAS CELL FOR ELECTRON SPECTROSCOPY

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For many years there has been a tacit assumption that core electron binding energies were affected by chemical changes but not by phase changes. This led to an uncertainty of approximately 3-5 eV in most core level energies estimated by combining x-ray emission data for solids and optical data for atoms or ions (1) With the realization that, mostly due to many electron relaxation effects the binding energies of the solids were systematically lower than those of the free atoms (2) it became clear that the core level binding energies in free atoms would be very valuable.

However, as metals and most other elements require very high temperatures to generate atomic species, the lack of suitable high temperature gas cells has drastically limited the availability of these binding energies.

A new versatile high temperature gas cell has been designed and a photoelectron spectrum of silver atoms was obtained at 1400 K(3). The design of this high temperature gas cell will be discussed.

References

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