CHAPTER 1

## A General Overview of Atomic Spectrometric Techniques

ALFREDO SANZ-MEDEL, ROSARIO PEREIRO AND JOSÉ MANUEL COSTA-FERNÁNDEZ

Department of Physical and Analytical Chemistry, University of Oviedo, Oviedo, Spain

### 1.1 Introduction: Basis of Analytical Atomic Spectrometric Techniques

Analytical atomic spectrometry comprises a considerable number of techniques based on distinct principles, with different performance characteristics and hence with varied application scopes, but in all cases providing elemental chemical information about the composition of samples. Figure 1.1 shows that these techniques can be classified into three main groups according to the type of particle detected: optical spectrometry, where the intensity of either non-absorbed photons (absorption) or emitted photons (emission and fluorescence) is detected as a function of photon energy (in most cases, plotted against wavelength); mass spectrometry (MS), where the number of atomic ions is determined as a function of their mass-to-charge ratio; and electron spectroscopy, where the number of electrons ejected from a given sample is measured according to their kinetic energy, which is directly related to the bonding energy of the corresponding electron in a given atom.

X-ray photoelectron spectroscopy (XPS) and Auger electron spectroscopy (AES) are the two main techniques based on electron spectroscopy. In XPS, a source of photons in the X-ray energy range is used to irradiate the sample.

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# **Spectrometric Techniques Volume 1**

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