

12.4.2 Signal recording

Abundance sensitivity

The ratio of the maximum ion current recorded at a mass m to the ion current arising from the same species recorded at an adjacent mass ($m \pm 1$).

Background mass spectrum

The mass spectrum recorded when no sample is intentionally introduced into the mass spectrometer or spectrograph.

Base peak

The peak in a mass spectrum corresponding to the separated ion beam which has the greatest intensity. This term may be applied to the spectra of pure substances or mixtures.

Intensity relative to base height

The ratio of intensity of a separated ion beam to the intensity of the separated ion beam that has the greatest intensity. This ratio is generally equated to the normalized ratio of the heights of the respective peaks in the mass spectrum, with the height of the base peak taken as 100.

Peak height

The height of a recorded peak in a mass spectrum.

Resolution: energy

By analogy with the the peak width definition of mass resolution, a peak showing the number of ions as a function of their translational energy should be used to give a value for energy resolution.

Resolution: 10 per cent valley definition

Let two peaks of equal height in a mass spectrum at masses m and $m - \Delta m$ be separated by a valley which at its lowest point is just 10% of the height of either peak. For similar peaks at a mass exceeding m , let the height of the valley at its lowest point

be more (by any amount) than 10% of either peak. Then the resolution (10% valley definition) is $m / \Delta m$. The ratio $m / \Delta m$ should be given for a number of values of m .

Resolution: peak width definition

For a single peak made up of singly charged ions at mass m in a mass spectrum, the resolution may be expressed as $m / \Delta m$, where Δm is the width of the peak at a height which is a specified fraction of the maximum peak height. It is recommended that one of three values 50%, 5% or 0.5% should always be used. (Note that for an isolated symmetrical peak recorded with a system which is linear in the range between 5% and 10% levels of the peak, the 5% peak width definition is equivalent to the 10% valley definition. A common standard is the definition of resolution based upon Δm being Full Width of the peak at Half its Maximum (FWHM) height.

Resolving power (mass)

The ability to distinguish between ions differing in the quotient mass/charge by a small increment. It may be characterized by giving the peak width, measured in mass units, expressed as a function of mass, for at least two points on the peak, specifically for 50% and for 5% of the maximum peak height.

Total ion current

- (1) *After mass analysis*, the sum of all the separate ion currents carried by the different ions contributing to the spectrum.
- (2) *Before mass analysis*, the sum of all the separate ion currents for ions of the same sign before mass analysis.