A ‘Periodic Table’ of mass spectrometry instrumentation and acronyms†

A l l e ee A . 1

The development and maturation of mass spectrometry (MS) technology has meant that MS users are no longer required to be experts in this field. With the increasing popularity of mass spectrometry (MS) with non-expert users, the Analytical Methods Committee (AMC) of the Royal Society of Chemistry has highlighted the need to generate a glossary of instrumentation terms that is accessible to users of this technology at all levels. In order to address a wide range of users it is also necessary to provide a context and explanation for the types of MS technology and their acronyms.

The number of acronyms is growing all the time, especially for hyphenated techniques, and overcoming their mystique was a key aim for the glossary. The ever-widening range of users has

(5) Data acquisition/processing

Samples that are analysed by MS can be in solid, liquid or gas form providing the sample can be ionised for mass analysis. The sample introduction method and ionisation sources available depend on the particular requirement. There are also a range of mass analysers available; each mass analyser will have characteristics that will lend itself to gaining information-rich data (mass spectra), for qualitative analysis or for measuring the relative abundance of a compound for quantification. Therefore, there is a broad and varied landscape of

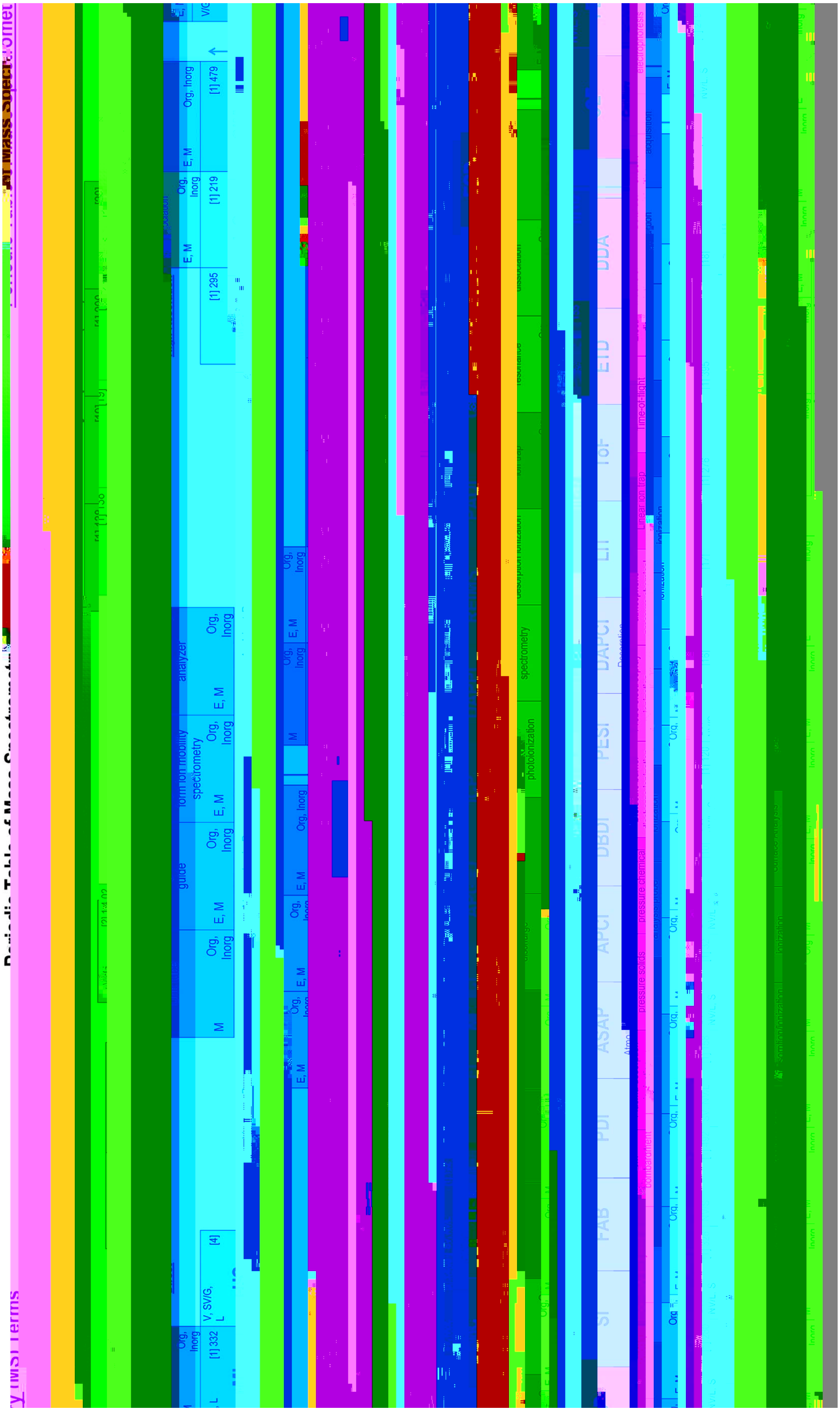

Fig. 1 er le e r er ( ) er .

Using the 'Periodic Table'

(***Note*** [illegible])

Mass spectrometry instruments and techniques are commonly named by using a string of acronyms each of which refers to one of the five major components described above. The string is usually assembled from left to right, beginning with sample introduction and finishing with the operational or data acquisition mode. The table reflects this in a series of columns moving across from left to right. Each column lists the more widely used current options for that component as a vertical series of boxes for which the key entry is the acronym of that option. Additional boxes for ion mobility separation are included in a separate row from the main table as variations of this technique may be used for sample introduction or mass analysis. Within each box is the description of the acronym and a number of abbreviations providing useful information about the component, as indicated in the legend to the table shown also in Fig. 2 below. The entry at top right in each box comprises the corresponding IUPAC number (if available) and a reference for further information. This reference can be accessed directly with electronic versions of the paper by clicking the acronym. An example of using the table to decipher technique acronyms is given at the top of the table shown also in Fig. 3 below.

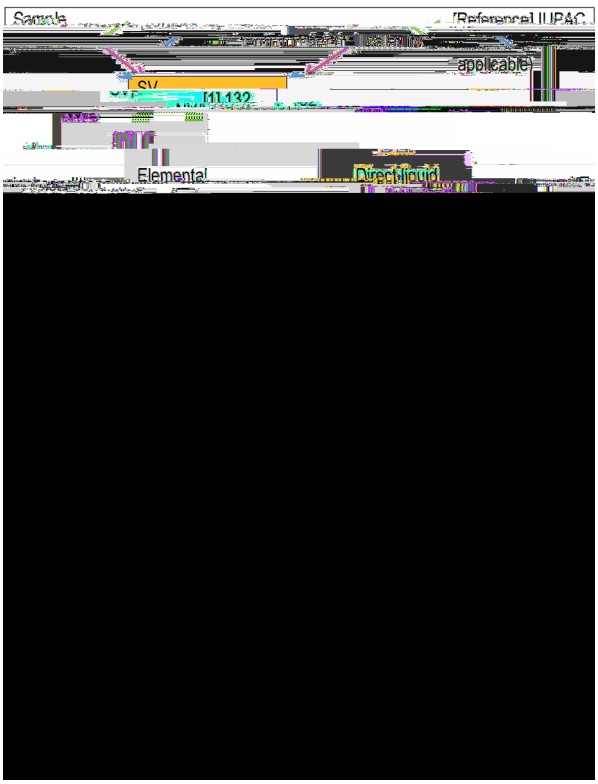

Fig. 2 [illegible]

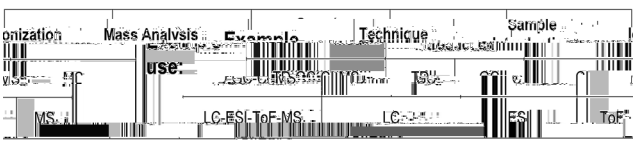

Fig. 3 [illegible]

Concluding remarks

The expanded range of instrumentation types available enables MS users to carry out a more targeted approach to analysis. This allows the analyst to tailor the method development to achieve the information necessary for the test material and the desired outcome. With the wide choice of instrumentation there is also great flexibility by virtue of certain modules (. . the sample introduction and ionisation source) often being interchangeable. This is evident in recent instrument developments offering alternative methods of ionisation within a universal housing. However, with these developments there is perforce a need to understand the relevant acronyms and when and why the technologies are used in combination. This Periodic Table of MS terms may offer some assistance in understanding these combinations.

For techniques not covered by IUPAC/terminology guides within the reference list seminal references have been cited where possible.

[illegible]

This report as prepared for the Anal tical Methods Committee ith contributions from members of the AMC Instrumental Anal sis Sub-committee and appro ed b the AMC on 03/07/17.

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