

per oxide, and may be heated, for example, to approximately 900° C. The resulting carbon dioxide, water and other oxides are then preferably passed through one or more cryogenic traps 17 in which the carbon dioxide is preferably separated from the other products of oxidation. The separated carbon dioxide is then preferably submitted or passed to an isotope ratio mass spectrometer for measurement of the relative abundance of its isotopes.

[0113] In the particular embodiment shown in FIG. 2 the carbon dioxide is preferably first passed to an Electron Impact ionisation source 18 arranged upstream of a mass analyser. Carbon dioxide is preferably ionised by the Electron Impact ionisation source 18 and the resulting ions accelerated from the ion source 18 are preferably passed to a magnetic sector mass analyser 19. The ions are then preferably separated in the magnetic sector mass analyser 19. The mass analyser 19 preferably comprises three separate ion collectors for measuring the ion currents of ions having mass to charge ratios of 44, 45 and 46 respectively. Alternatively, one, two or more than three ion collectors may be provided. Other embodiments are contemplated wherein other types of mass spectrometer or mass analyser may be provided. The ratios of the three signals output from the three ion collectors are preferably used to determine the relative abundances of the isotopes of carbon. These ratios may then be compared to those of a known standard in order to minimise or eliminate instrumental factors which may otherwise distort these measurements.

[0114] Although the present invention has been described with reference to preferred embodiments, it will be understood by those skilled in the art that various changes in form or detail may be made without departing from the scope of the invention as set forth in the accompanying claims.

1. A mass spectrometer comprising:
 - a first device for separating or dispersing analyte atoms, molecules or ions;
 - a first ion source arranged downstream of said first device, said first ion source being arranged and adapted to ionise analyte atoms, molecules or ions received from said first device;
 - a second device for separating analyte ions from other ions, said second device comprising one or more electrodes;
 - a combustion chamber arranged to receive and at least partially combust at least some analyte ions; and
 - a mass analyser arranged downstream of said combustion chamber.
2. (canceled)
3. (canceled)
4. A mass spectrometer as claimed in claim 1, wherein said first device comprises a liquid chromatography device.
5. (canceled)
6. A mass spectrometer as claimed in claim 1, wherein said first ion source is selected from the group consisting of: (i) an Electrospray ionisation (“ESI”) ion source; (ii) an Atmospheric Pressure Photo Ionisation (“APPI”) ion source; (iii) an Atmospheric Pressure Chemical Ionisation (“APCI”) ion source; (iv) a Matrix Assisted Laser Desorption Ionisation (“MALDI”) ion source; (v) a Laser Desorption Ionisation (“LDI”) ion source; (vi) an Atmospheric Pressure Ionisation (“API”) ion source; (vii) a Desorption Ionisation on Silicon (“DIOS”) ion source; (viii) an Electron Impact (“EI”) ion source; (ix) a Chemical Ionisation (“CI”) ion source; (x) a Field Ionisation (“FI”) ion source; (xi) a Field Desorption (“FD”) ion source; (xii) an Inductively Coupled Plasma (“ICP”) ion source; (xiii) a Fast Atom Bombardment (“FAB”) ion source; (xiv) a Liquid Secondary Ion Mass Spectrometry (“LSIMS”) ion source; (xv) a Desorption Electrospray Ionisation (“DESI”) ion source; (xvi) a Nickel-63 radioactive ion source; (xvii) an Atmospheric Pressure Matrix Assisted Laser Desorption Ionisation ion source; and (xviii) a Thermospray ion source.

7. (canceled)

8. A mass spectrometer as claimed in claim 1, wherein said second device is selected from the group consisting of: (i) a high field asymmetric waveform ion mobility separator or spectrometer; (ii) an ion mobility separator or spectrometer; (iii) a gas phase electrophoresis device; (iv) a differential ion mobility separator, spectrometer or device; (v) a Field Asymmetric Ion Mobility Spectrometry (“FAIMS”) device; (vi) a gas phase ion separator or spectrometer; (vii) a device for separating ions according to their mobility; and (viii) a device for separating ions according to differences or changes of their ion mobility with electric field strength.

9. A mass spectrometer as claimed in claim 1, further comprising first voltage means arranged and adapted to apply an asymmetric voltage waveform to said one or more electrodes.

10-16. (canceled)

17. A mass spectrometer as claimed in claim 1, further comprising second voltage means arranged and adapted to apply a DC compensation voltage to said one or more electrodes.

18-20. (canceled)

21. A mass spectrometer as claimed in claim 1, further comprising means arranged so as to provide a first stream of gas which flows, in use, through said second device and wherein at least some ions are arranged to be onwardly transmitted axially through said second device by being entrained in said first stream of gas, wherein said first stream of gas comprises one or more gases selected from the group consisting of: (i) nitrogen; (ii) helium; and (iii) oxygen.

22. (canceled)

23. A mass spectrometer as claimed in claim 1, wherein said second device comprises two or more substantially parallel electrodes or two or more substantially co-axial cylindrical, spherical or hemi-spherical electrodes.

24. (canceled)

25. (canceled)

26. A mass spectrometer as claimed in claim 1, wherein said second device comprises a plurality of axial segments or an array of electrodes.

27. (canceled)

28. A mass spectrometer as claimed in claim 26, further comprising further voltage means arranged and adapted to apply one or more voltages or potentials or one or more voltage or potential waveforms to said plurality of axial segments or said array of electrodes in order to urge, propel, force or accelerate at least some ions through and/or along at least a portion of the axial length of said second device.

29-31. (canceled)

32. A mass spectrometer as claimed in claim 1, further comprising means for applying a two-phase or multi-phase AC or RF voltage or signal to said one or more electrodes of said second device in order to radially confine at least some ions within said second device.

33-41. (canceled)

42. A mass spectrometer as claimed in claim 1, wherein said second device is arranged and adapted to separate analyte ions from solvent ions by arranging for analyte ions to be