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Claims:

- 5 1. An ion guide assembly comprising:
 two planar mounting components;
 first and second ion guides mounted on the two planar mounting components such
 that the ion guides are spaced apart from each other, wherein at least one of the planar
 mounting components has an aperture therethrough that is located between the positions
10 on said at least one mounting component at which the first and second ion guides are
 mounted; and
 an ion optical device sized and configured to be inserted through the aperture in the
 planar mounting component and into the space between the first and second ion guides.
- 15 2. The ion guide assembly of claim 1, wherein the aperture has a size in the
 dimension between the first and second ion guides that is selected from the group
 consisting of: ≥ 5 mm; ≥ 10 mm; ≥ 15 mm; ≥ 20 mm; ≤ 30 mm; ≤ 25 mm; ≤ 20 mm; ≤ 10
 mm; or between 5 and 20 mm; and/or
 wherein the aperture has a size in the dimension orthogonal to the direction
20 between the first and second ion guides that is selected from the group consisting of: ≥ 5
 mm; ≥ 10 mm; ≥ 15 mm; ≥ 20 mm; ≥ 25 mm; ≥ 30 mm; ≤ 40 mm; ≤ 35 mm; ≤ 30 mm; ≤ 25
 mm; ≤ 20 mm; ≤ 15 mm; between 5 and 30 mm; or between 10 and 25 mm.
- 25 3. The ion guide assembly of claim 1 or 2, wherein the two planar mounting
 components are arranged with their major faces facing each other, and wherein the first
 and second ion guides are located between the two planar mounting components.
- 30 4. The ion guide assembly of claim 1, 2 or 3, wherein the first ion guide defines a first
 axis along which it guides ions and the second ion guide defines a second axis along which
 it guides ions, wherein the first and second axes are coaxial.
- 35 5. The ion guide assembly of any preceding claim, wherein one or both of the two
 mounting components is a printed circuit board having electrical contacts thereon, and
 wherein electrodes of the first and/or second ion guide are electrically connected to said
 electrical contacts for applying voltages to the first and/or second ion guide via the PCB.
- 40 6. The ion guide assembly of any preceding claim, wherein space between the two
 planar mounting components and around the first ion guide is sealed so as to define a first
 gas cell in which the first ion guide is located; and/or
 wherein space between the two planar mounting components and around the
 second ion guide is sealed so as to define a second gas cell in which the second ion guide
 is located.

7. The ion guide assembly of any preceding claim, comprising at least one mounting fixture mounted to the planar mounting components for mounting the ion optical device to the mounting fixtures.
- 5 8. The ion guide assembly of claim 7, wherein the mounting components each comprise a slotted aperture in which the mounting fixture is located.
- 10 9. The ion guide assembly of claim 7 or 8, wherein the mounting fixture has surfaces that abut against the major surfaces of the planar mounting components.
- 15 10. The ion guide assembly of claim 7, 8 or 9, wherein the mounting fixture comprises one or more projection that extends through a hole in one or both of the planar mounting components, respectively, and wherein the one or more projection is confined by the one or more hole, respectively, so as to prevent movement of the mounting fixture.
- 20 11. The ion guide assembly of any one of claims 7-10, wherein the mounting fixture comprises screws, bolts, clips or other attachment mechanisms for mounting the ion optical device to the mounting fixture.
- 25 12. The ion guide assembly of any preceding claim, wherein the ion optical device is mounted to the planar mounting components between the first and second ion guides.
- 30 13. The ion guide assembly of any preceding claim, wherein the ion optical device comprises a plurality of electrodes arranged so as to define an ion entrance and an ion exit that are configured such that when the ion optical device is arranged between the first and second ion guides the ion optical device is able to receive ions from the first ion guide through the ion entrance and transmit ions into the second ion guide through the ion exit.
- 35 14. The ion guide assembly of any preceding claim, wherein the ion optical device is a fragmentation device for fragmenting precursor analyte ions to form daughter ions, an activation device for activating ions, or a reaction device for reacting analyte ions with other ions or non-ionic molecules.
- 40 15. A mass or mobility spectrometer comprising:
an ion guide assembly as claimed in any preceding claim; and
a mass or mobility analyser downstream of the ion guide assembly.
16. The spectrometer of claim 15, comprising one or more vacuum chamber in which the ion guide assembly is arranged, and one or more vacuum pump for evacuating the one or more vacuum chamber, wherein the spectrometer is configured to control the vacuum

pump so as to maintain the first and/or second ion guide at a pressure of at least 0.001 mbar.

5 17. The spectrometer of claim 15 or 16, comprising a closed-loop ion mobility separator.

18. A method comprising:
providing the ion guide assembly, or mass or mobility spectrometer, of any preceding claim; and
10 inserting the ion optical device through the aperture in the planar mounting component and into the space between the first and second ion guides.

19. A method of mass or mobility spectrometry comprising:
providing the mass or mobility spectrometer of any one of claims 15-17;
15 guiding ions through the first ion guide, into the ion optical device and then through the second ion guide; and
mass or mobility analysing ions downstream of the second ion guide.

20. An ion guide assembly comprising:
20 a mounting component;
first and second ion guides mounted on the mounting component such that the ion guides are spaced apart from each other, wherein the mounting component has an aperture therethrough that is located between the positions on the mounting component at which the first and second ion guides are mounted; and
25 an ion optical device sized and configured to be inserted through the aperture in the mounting component and into the space between the first and second ion guides.