CLAIMS:

1. A detector comprising one or more electron emissive surfaces, the detector being operable in a vacuum chamber and comprising one or more detector housing or enclosure elements configured to define on one side an environment about the detector and on the other side an environment of the vacuum chamber, wherein the one or more detector housing or enclosure elements are configured to inhibit or prevent flow of a gas from the vacuum chamber to the environment about the detector,
wherein the one or more detector housing or enclosure elements comprise:

(i) first and second detector housing or enclosure elements associated so as to form an interface, or

(ii) a unitary detector housing or enclosure element having a discontinuity,
and the interface or discontinuity is configured to inhibit or prevent the flow of a gas from the vacuum chamber to the environment about the detector.

2. The detector of claim 1, wherein a sealant is disposed within or about the interface or discontinuity so as to inhibit or prevent the flow of a gas from the environment about the detector to the environment of the vacuum chamber.

3. The detector of claim 1 or claim 2, wherein the first and/or second detector housing or enclosure elements are configured such that a non-linear or tortuous path between the environment about the detector to the environment of the vacuum chamber is provided at the interface of the first and second detector housing or enclosure elements.

4. The detector of any one of claims 1 to 3, wherein the first and second detector housing or enclosure elements are positioned or angled relative to each other such that a non-linear or tortuous path between the environment about the detector and the environment of the vacuum chamber is provided at the interface between the first and second detector housing or enclosure elements.

5. The detector of any one of claims 1 to 4, wherein the first and/or second detector housing or enclosure elements is/are shaped such that a non-linear or tortuous path between the environment about the detector and the environment of the vacuum chamber is provided at the interface between the first and/or second detector housing or enclosure elements.

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6. The detector of any one of claims 3 to 5, wherein the non-linear or tortuous path is at a macroscopic level.

7. The detector of any one of claims 3 to 6, wherein the non-linear or tortuous path comprises two or more linear sub-paths, wherein an angle is formed at the intersection of each of the two or more linear sub-paths.

8. The detector of claim 7, wherein the angle formed is greater than about 45 degrees.

9. The detector of any one of claims 4 to 8, wherein the non-linear or tortuous path is curved, or comprises a curve, or comprises a series of curves.

10. The detector of any one of claims 1 to 9, wherein the first detector housing or enclosure element comprises a first formation or recess, and the second detector housing or enclosure element comprises a second formation or recess, and wherein the first formation or recess snugly fits the second formation or recess so as to provide the interface between first and second detector housing or enclosure elements.

11. The detector of claim 10, wherein the first detector housing or enclosure element comprises multiple formations and/or recesses, and the second detector housing or enclosure element comprises multiple formations and/or recesses, and wherein the formations and/or recesses of the first detector housing or enclosure element snugly fit the second formations and/or recesses of the second detector housing or enclosure element so as to provide the interface or a part of the interface between first and second detector housing or enclosure elements.

12. The detector of any one of claims 1 to 11, comprising at least about 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45 or 50 interfaces between detector housing or enclosure elements, the interfaces between the detector housing or enclosure elements being configured to inhibit or prevent the flow of a gas from the environment about the detector to the environment of the vacuum chamber.

13. The detector of any one of claims 1 to 12 comprising:

first and second detector housing or enclosure elements defining a space

therebetween, and

a deformable member or a mass occupying the space, wherein the first and second detector housing or enclosure elements and the deformable member or mass are configured to define on one side an environment about the detector and on the other side an environment of the vacuum chamber.

14. The detector of claim 13, wherein the deformable member or mass is configured to inhibit or prevent entry of a gas external the detector into the detector.

15. The detector of any one of claims 1 to 14, wherein one or more of the detector housing or enclosure elements is an element configured to inhibit or prevent entry of a gas external the detector into the detector.

16. The detector of any one of claims 1 to 15, wherein the gas is a residual gas usable as a sample carrier gas in a mass spectrometer.

17. The detector of any one of claims 1 to 16, wherein the first and/or second detector housing or enclosure elements; and/or the interface between the first and second detector housing or enclosure elements is/are configured so as to decrease a vacuum conductance of the detector.

18. The detector of any one of claims 1 to 17, wherein the one or more detector elements is/are a gas flow barrier capable of decreasing the vacuum conductance of the detector.

19. A mass spectrometer comprising the detector of any one of claims 1 to 18.

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