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 elements configured to define on one side an environment internal the detector and on the other side an environment external the detector, wherein the one or more detector elements are configured to inhibit or prevent flow of a gas from the environment external the detector to the environment internal the detector,

wherein the one or more detector elements comprise:

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

(ii) a unitary detector element having a discontinuity,

and the interface or discontinuity is configured to inhibit or prevent the flow of a gas from the environment external the detector to the environment internal 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 external the detector to the environment internal the detector.

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

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

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

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 element comprises a first formation or recess, and the second detector 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 elements.

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

12. The detector of any one of claims 1 to 11, wherein one or more of the detector elements is a detector housing element, or a detector enclosure element, or a detector support element.

13. The detector of any one of claims 1 to 12, 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 elements, the interfaces between the detector elements being configured to inhibit or prevent the flow of a gas from the environment external the detector to the environment internal the detector.

14. The detector of any one of claims 1 to 13 comprising:
first and second detector elements defining a space therebetween, and

a deformable member or a mass occupying the space, wherein the first and second detector elements and the deformable member or mass are configured to define on one side an environment internal the detector and on the other side an environment external the detector.

15. The detector of claim 14, wherein the deformable member or mass is 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 one or more of the detector elements is an element configured to inhibit or prevent entry of a gas external the detector into the detector.

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

18. The detector of any one of claims 1 to 17, wherein when the detector is in operation within the vacuum chamber of a mass spectrometer the inhibition or prevention of the flow of a gas from the environment external the detector to the environment internal the detector is sufficient so as to cause the environment about the electron emissive surface(s) or a collector/anode surface of the detector to be different to the environment immediately external to the detector with regard to: the presence, absence or partial pressure of a gas species in the respective environments; and/or the presence, absence or concentration of a contaminant species in the respective environments.

19. The detector of any one of claims 1 to 18, wherein the first and/or second detector elements; and/or the interface between the first and second detector elements is/are configured so as to decrease a vacuum conductance of the detector.

20. The detector of any one of claims 1 to 19, wherein the one or more detector elements is/are a gas flow barrier capable of decreasing the vacuum conductance of the detector.

21. A mass spectrometer comprising the detector of any one of claims 1 to 20.