CLAIMS

1. A breath container adapted for use with a breath capture device, the container comprising:

a body comprising an inlet;

a capture volume inside the body and comprising at least two compartments; and

a valve assembly positioned in the body and having an open condition to permit a flow of breath from the breath capture device into each of the compartments and a closed condition to contain breath in the compartments, wherein the valve assembly comprises a valve for each compartment and the valve assembly is configured to open and/or close the valve for each respective compartment, in a predetermined sequence, wherein one of the capture volume and body comprises a suction port by which suction can be applied to the capture volume or body to shrink an internal volume of the capture volume or body and thereby apply pressure to the at least two compartments.

2. The breath container of claim 1, wherein the predetermined sequence is selected to capture, in successive ones of the compartments, one of:

successive portions of an exhaled breath; and

a common portion, from successive breaths.

3. The breath container of claim 1 or 2, further comprising a humidity controller for controlling a relative humidity level within the capture volume.

4. The breath container of claim 3, wherein the humidity controller controls humidity within each compartment.

5. The breath container of claim 3 or 4, wherein the humidity controller comprises a temperature controller for controlling a temperature of at least a portion of the capture volume.

6. The breath container of claim 5, wherein the temperature controller controls the temperature to maintain a predetermined relative humidity differential between the portion of the capture volume and atmosphere outside the capture volume.

7. The breath container of any one of claims 3 to 6, wherein the humidity controller comprises a desiccant filter between the capture volume and the inlet.

8. The breath container of any one of claims 3 to 7, wherein the humidity controller comprises a desiccant material located in at least one of the body and the capture volume.

9. A breath capture device for use with a breath container according to any one of claims 1 to 8, comprising:

a device body comprising a device inlet;

a connector for connecting to the breath container, to admit a flow of breath from the inlet into the breath container; and

a desiccant device positioned within the device body, between the device inlet and the connector.

10. A breath sampling system comprising:

a device according to claim 9; and

a breath container according to any one of claims 1 to 8, coupled to the device.

11. A breath analysis system comprising:

the breath container according to any one of claims 1 to 8; and

a facial mask comprising:

a mask body shaped to cover a mouth of a user;

an air control system in communication with the mask body, comprising:

an inlet for air to enter the mask body during inhalation;

an outlet with mouthpiece that extends into the mouth, during use, through which exhaled breath exits the

mask body during exhalation, the outlet being having a connection for connecting to a breath sampling system; and

a one-way valve assembly between the mask body and the connection.

12. The breath analysis system of claim 11, wherein the air control system comprises a desiccant device positioned between the one-way valve and the outlet.

13. The breath analysis system of claim 11 or 12, wherein the desiccant device comprises a desiccant filter.

14. The breath analysis system of any one of claims 11 to 13, wherein the outlet is adapted to connect to mass spectrometer inlet tubing, to facilitate direct transfer of breath from the mask to a mass spectrometer.

15. The breath analysis system of any one of claims 11 to 13, wherein the outlet is adapted to connect to the breath sampling system of claim 10, to facilitate direct transfer of breath from the mask to the breath sampling system.

16. The breath analysis system of any one of claims 11 to 15, wherein the outlet comprises a luer activated port for connection to a luer fitting of the breath sampling system.

17. The breath analysis system of any one of claims 11 to 16, wherein the one-way valve assembly comprises a droplet filter for removing droplets from the exhaled breath.