CLAIMS

What is claimed is:

1. A sensing system for detecting an ammonia or ammonium substance in a dialysate, comprising:

a hydrophobic barrier capable of allowing the substance in the dialysate to diffuse across the barrier to a gas;

a detector capable of detecting the substance; and

a channel disposed between the hydrophobic barrier and the detector and configured to allow transport of the gas between the hydrophobic barrier and the detector following a concentration gradient of the gas along the channel,

wherein the hydrophobic barrier is in fluid communication with the dialysate, and the hydrophobic barrier comprises a deformable diaphragm that is configured to deform in response to pressure changes in the dialysate.

2. The sensing system as claimed in claim 1, wherein the channel is configured to be about 0.1mm to 10mm in length.

3. The sensing system as claimed in claim 1, wherein the channel is configured to be about 1.0mm in length.

4. The sensing system as claimed in claim 1, wherein deformations of the deformable diaphragm produce gas movement within the channel to increase a rate of the transport of the gas between the hydrophobic barrier and the detector.

5. The sensing system as claimed in claim 1, wherein the hydrophobic barrier comprises a degasser barrier or a bacteria filter.

6. The sensing system as claimed in claim 1, further comprising an ammonia-gas-compatible water absorber within the channel.

7. The sensing system as claimed in claim 1, further comprising a disposable housing, wherein the disposable housing comprises a dialysate flow path and the hydrophobic barrier, and wherein the channel is disposed between the disposable housing and the detector, the channel being separated from the dialysate by the hydrophobic barrier.

8. A sensing system for detecting an ammonia or ammonium substance in a dialysate, comprising:

a hydrophobic barrier in contact with the dialysate and capable of allowing the substance in the dialysate to diffuse across the barrier to a gas;

a detector capable of detecting the substance; and

a channel disposed between the hydrophobic barrier and the detector and configured to allow fluid communication of the gas between the hydrophobic barrier and the detector,

wherein the channel comprises a deformable diaphragm in contact with the dialysate and configured to produce a back and forth gas movement within the channel in response to fluid pressure variations in the dialysate.

9. The system as claimed in claim 8, further comprising a dialysate flow path, wherein the hydrophobic barrier and deformable diaphragm are in contact with the dialysate in the dialysate flow path.

10. The system as claimed in claim 8, further comprising a peristaltic pump such that operation of the peristaltic pump produces the fluid pressure variations in the dialysate.

11. The system as claimed in claim 1 or 8, wherein the detector comprises a material which changes colour in the presence of ammonia.

12. The system as claimed in claim 1 or 8, wherein the detector comprises an ammonia-sensitive membrane.

13. The system as claimed in claim 1 or 8, wherein the detector comprises an ammonia-selective potentiometric or amperometric electrode.