



## **Method Summary**

### **Determination of Bulk Gas Composition (suite 1)**

#### **Scope and Range**

Dissolved gas analysis is used environmentally to investigate boreholes, trial pits, spill troughs and landfill sites.

This method is used for the determination of the dissolved gases, specifically methane, ethene, ethane and carbon dioxide in aqueous samples using a low-level method, 1-1000ppm v/v and a high level method, 1000-40,000ppm v/v.

Higher alkanes can also be quantified by this method if required.

The range for the hydrocarbons is 1 ppm v/v to 40,000ppm v/v of the headspace.

The range for carbon dioxide is 0.05% v/v to 50% v/v of the headspace.

This method is unaccredited.

#### **References**

HMSO 1988, The Determination of Methane and Other Hydrocarbons Gases in Water

#### **Principle**

Preparation and Extraction:

Samples should be received in 40 ml vials, filled to the brim, sealed with a septum and stored at 1-8°C.

The aqueous sample is heated to drive the volatile components into the headspace.

A known volume of the headspace is introduced into the gas chromatograph via the gas sample loop within the injection system and is analysed by temperature programmed gas chromatography using a GC fitted with 3 different columns and 2 different detectors.

The gas components are separated according to their boiling points and/or affinity for the stationary phase and identified from their retention times.

Methane and ethane are resolved on a capillary column and quantified against a 4-point calibration curve. Ethene is resolved on a capillary column, quantified against the response factor for ethane and corrected for molecular mass differences.

Carbon dioxide is resolved on a packed column and molecular sieve then quantified against a 5-point calibration curve.

Results are reported in Labware to 3 significant figures.

#### **Interferences**

Flame ionisation and thermal conductance are non-specific means of detection, therefore, any substances, that co-elute from the chromatographic column with any of the components of interest will interfere with this determination.