



Model 926 Mk II Chloride Analysers

The Sherwood Model 926

is used for the determination of chloride ions. It is an instrumental analogue of "Argentimetry", the traditional titrimetric methods using silver nitrate reagent. Like these classic methods it relies on the chemical formation of the very insoluble salt, silver chloride.

The importance of chloride determination has been realised for well over a century, with many variations and changes being made to the techniques in order to improve the detectability and selectivity. Research into the analysis of chloride was conducted by Gay-Lussac (1832), Levil (1853), Mohr (1856) and Volhard(1874) and their findings have proven to be the basis of the methods which are still in common use today.

The first instrument using these techniques was developed in the 1960's by Cotlove at the AMINCO company. These products are now exclusively manufactured at Cambridge in the UK by Sherwood Scientific.Ltd.

Key Application areas:

Industrial

The measurement of Salt (sodium chloride) in the Food and Dairy Industry is universal. The ability to read directly in Salt concentration and the Automatic Endpoint Detection system has made the Sherwood Model 926 the instrument of choice for Food Manufacturers and analysts throughout the world.

Salt and salinity also represents serious contamination in many industrial processes. The sensitivity of the coulometric method enables measurements in the ppm range in boiler feed water; polymer washes; bore-hole slurries as well as soil-salinity studies.

The Model 926 is intended for general laboratory use and is calibrated in ppm (mg/l) chloride. It has a simple factor switch enabling the immediate translation of chloride content into mg% Salt (sodium chloride) of the original sample (See Below)

Clinical

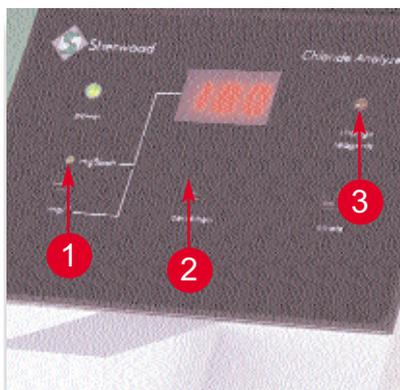
Raised chloride concentrations in sweat samples of young children is one indicator of Cystic Fibrosis.

The Model 926S is intended for chloride measurements in biological samples and is calibrated in mmol/l. The Model 926S can accept original samples of as little as 20µl.

Method of Operation

The main difficulties with the classic method were that silver nitrate reagent would change on storage due to a photochemical reaction and that the titration end point is visually weak. The reagent would have to be standardised requiring a highly skilled analytical technician.

The 926 method is based on a coulometric titration and is an absolute method where the reagent, the silver ions, is precisely and quantitatively generated at the time of the analysis by passing a constant current between electrodes. The end-point is detected by the use of sensing electrodes which measure the change in solution conductivity which occurs when excess silver ions are present in solution.



1. 926 Factor Button
Factor conversion to Salt concentration.

926S Switch
Selects sample volume (100µl/20µl).

2. Condition Button
Titrate any contaminant in buffer and sensitises to endpoint.

3. Titrate Button
Initiates titration sequence.

Reagents

Acid Buffer

This is a non-hazardous mixture of Glacial Acetic and Nitric acids together with other components designed to give highly reproducible results when used with the Models 926 and 926S. It provides the strongly acidic medium required for the dissolution and reaction between the silver and chloride ions.



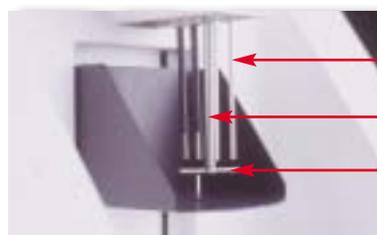
Chloride standards

Calibrated both in mg/l and mmol/l are traceable to NIST standards. These stable solutions are used to verify the accuracy of the instrumentation and pipetting operation.

Silver polish

Used to keep the pure silver electrodes in good condition.

Electrodes



Donor Electrode

Detector Electrode

Constant Stirring

The anode is a pure silver electrode, which is "sacrificed" by dissolution into silver ions. Once the end of the electrode is dissolved the anode can be repositioned for extended use. The cathode completes the electrical circuit with the anode. Two detector electrodes monitor the conductivity of the reacting solution.

Pipetting and accuracy of the Chloride Meters

The accuracy of the method is directly affected by the volume of sample dispensed by the pipette. A fixed volume (500µl for the Model 926; 100 or 20 µl for Model 926S) is pipetted directly into the Acid Buffer solution. A further 6 samples model 926; 21 samples for the Model 926S may be added into the same buffer before the instrument prompts a reagent change.

The Sherwood Advantage

- The coulometric method is very robust and versatile.
- The Sherwood microprocessor based Instrument is ergonomically designed and easy to use and maintain.
- The Sherwood Buffer System specifically designed for the model 926 gives outstanding sensitivity and selectivity.

Data Manipulation with DataGate

The models 926 and 926S are equipped with RS232 serial outputs which enable them not only to be linked to a suitable printer, but also to be interfaced to the powerful DataGate system. DataGate is designed to offer full calculation facility, GLP protocols and interfacing with sample weighing balances from several manufacturers. Full details available on a separate leaflet included with this brochure.



Specifications

Instrument	Model 926 MK II	Model 926S MK II
Application	Industrial	Biomedical
Units	mg/l	mmol/l
Sample size	500µl	100µl or 20 µl
Readout Range	10- 999 mg/l 2-165 mg% Salt	10-299 mmol/l
Accuracy	±3 mg/l at the 200 mg/l level	Results would be within one Standard deviation of the mean values of recognized QC schemes i.e. within ±2.2 mmol/l at the 100 mmol/l level
Reproducibility	CV < 1% for 20 replicate samples @200 mg/l (excluding pipetting errors)	CV 100µl sample <1% 20µl sample <1.5%
Measurement time	36 seconds to 100 mg/l	26 seconds to 100 mmol/l
Part Number	92611000	92611005
Voltage	100,115,200,230,240 V AC ±10%	Same
Size	315 mm x 200 mm x 250 mm	Same
packed	385 mm x 370 mm x 450 mm	Same
Weight net	3.8 kg	Same
gross	7.0 kg	Same
Packed unit contains	Model 926, Printer cable 9 way RS232, Acid buffer (500 ml), 200 mg/l standard (100 ml) , 3 anodes , set electrodes, 2 marked beakers, Electrode cleaning polish, Stirrer and Operator Manual.	Model 926S, Printer cable 9 way RS232, Acid buffer (500 ml) , 100 mmol/l Standard (100 ml), 3 anodes , set electrodes, 2 marked beakers, Electrode cleaning polish, Stirrer and Operator Manual.

Ordering Information

MODEL 926 MARK II CHLORIDE ANALYSER	92611000
MODEL 926S MARK II CHLORIDE ANALYSER	92611005
100mmol/litre Standard	6 x 100 ml
200mg/litre Standard	6 x 100 ml
Electrode Activation Paste	00156205
Reagent System Acid Buffer	500 ml
Anodes	Pack 3
Electrode detectors and cathode	92511003
Reaction Beaker	92511009



Based in Cambridge, the Centre of Scientific Excellence in the UK, Sherwood Scientific is a Development and Manufacturing company with a history of successful innovations.

Sherwood manufactures the world famous CHROMA Colorimeters, Flame Photometers, Chloride Analyser and Spectrophotometer. Originally introduced by EEL in the 1950s, these products were further developed by Corning and now Sherwood. Sherwood Scientific also manufactures the MICROWELDER gas generator-based flame welding system used in jewellery, electronics and acrylic sign manufacturing; a range of Laboratory Fluid Bed Dryers; and the world's most sensitive Magnetic Susceptibility Balance.

Each instrument is individually tested by running actual samples before being shipped to one of over 100 countries where Sherwood Scientific has selected distributors.

Sherwood Scientific is represented in most of the markets in the world through a network of leading distributors. These distributors and their customers attend courses on existing and new products at Sherwood's modern training facility in Cambridge. Sherwood and its

local distributors can also be contacted via the Internet where news of products, applications and other information is regularly updated.



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