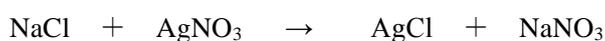


<b>HIRANUMA APPLICATION DATA</b>	Automatic Titrator	Data No.	B15	Sep. 12, 2018
<b>Drugs and Medicines</b>	<b>Sodium chloride in peritoneal dialysis solution</b>			

## 1. Abstract

This report introduces an example of measurement for sodium chloride in peritoneal dialysis solution with precipitation titration. The sample is acidified by nitric acid and the concentration of sodium chloride is determined by precipitation titration with silver nitrate titrant using the silver / reference electrode.



## 2. Configuration of instruments and Reagents

### (1) Instruments

Main unit : Hiranuma Automatic Titrator COM Series

Electrode : Silver combination electrode AGR-811Z (Double Junction Type)

\*The following electrodes are also usable.

- AGR-801Z (Silver reference combination electrode)
- Combination of AG-311 (Silver indicator electrode) and MS-231Z (Silver reference electrode)
- Combination of AG-311 and RE-241Z (Double junction type silver reference electrode)

\* Remark

The general reference electrode (RE-201Z) cannot be used for this titration because KCl inner solution might come out to sample solution and it causes measurement error.

The inner electrodes of AGR-801Z and MS-231Z use mercury (I) sulfate. When these electrodes are disposed, please ask local industrial waste disposal operator.

### (2) Reagents

Titrant : 0.1 mol/L Silver nitrate standard solution

Additive : 1 mol/L Nitric acid

## 3. Measurement procedure

- (1) Take 10 ml of sample into 100 mL beaker with volumetric pipette.
- (2) Add 40 ml of DI water.
- (3) Add 2 ml of 1 mol / L nitric acid.
- (4) Immerse the electrodes and titrate with 0.1 mol/L silver nitrate standard solution.

## 4. Measurement conditions and results

### Examples of titration conditions

#### Measurement of blank

Cndt No.	1	ConstantNo.	1	Mode No.	14
Method	Auto	Size	0 mL	Pre Int	0 sec
Buret No.	1	Blank	0 mL	Del K	0
Amp No.	2	Molarity	0.1 mol/L	Del Sens	0 mV
D. Unit	mV	Factor	1.001	Int Time	5 sec
S-Timer	10 sec	K	0	Int Sens	3 mV
C.P. mL	0 mL	L	0	BrT Speed	2
T Timer	0 sec	Unit	mL	Pulse	8
D.P. mL	0 mL	Formula	D		0.01 mL
End Sens	500	Digits	3		
Over mL	0.1 mL	Auto In Pram.	Non		
Max.Vol.	1 mL				

#### Measurement of sample

Cndt No.	2	ConstantNo.	2	Mode No.	4
Method	Auto	Size	10 mL	Pre Int	0 sec
Buret No.	1	Blank	0.015 mL	Del K	9
Amp No.	2	Molarity	0.1 mol/L	Del Sens	0 mV
D. Unit	mV	Factor	1.001	Int Time	3 sec
S-Timer	10 sec	K	58.44	Int Sens	3 mV
C.P. mL	0 mL	L	0	BrT Speed	2
T Timer	0 sec	Unit	g/L	Pulse	40
D.P. mL	0 mL	Formula	(D-B)*K*F*M/S		0.05 mL
End Sens	500	Digits	4		
Over mL	0.1 mL	Auto In Pram.	Non		
Max.Vol.	20 mL				

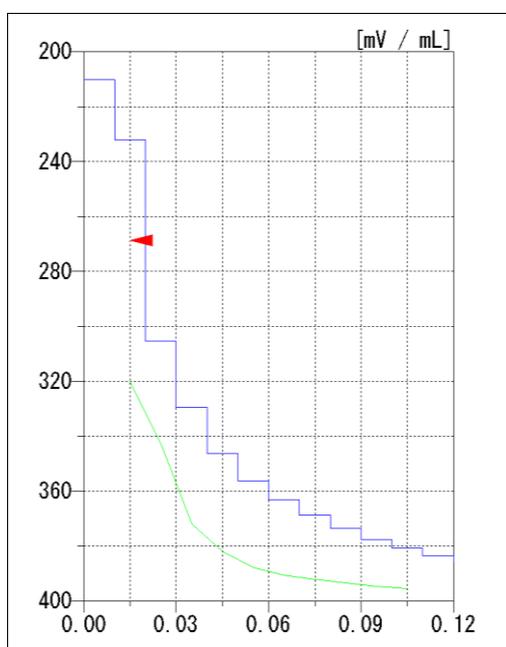
## Measurement results

Measurement of blank

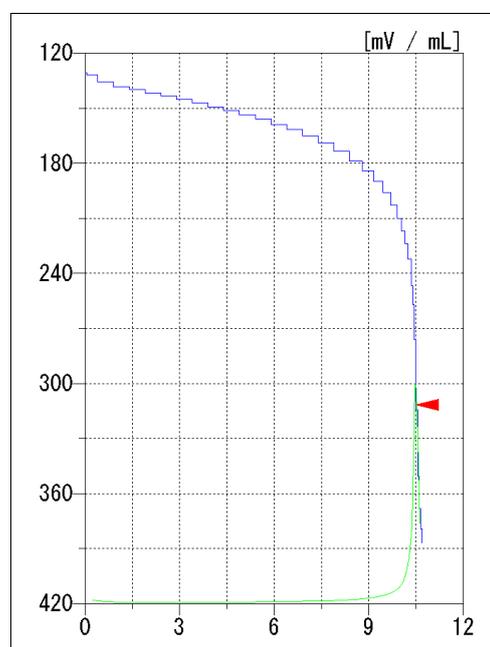
Measurement No.	Size (mL)	Titrant volume (mL)
1	-	0.017
2	-	0.013
3	-	0.015
Statistical result	Avg. (mL)	0.015

Measurement of sample

Measurement No.	Size (mL)	Titrant volume (mL)	Sodium chloride (g/L)
1		10.497	6.1318
2	10	10.490	6.1277
3		10.509	6.1388
Statistical result		Avg. (g/L)	6.133
		SD (g/L)	0.006
		RSD (%)	0.092



Measurement of blank



Measurement of sample

### Examples of titration curves

## 5. Note

If the precipitate adheres to the electrode after measurement, please clean it and remove it.

Chloride in peritoneal dialysate solution may contain not only sodium chloride but also calcium chloride and magnesium chloride. Please note that the chloride to be measured is calculated by converting these combined amounts into sodium chloride.

Keywords : Peritoneal dialysate solution, Sodium chloride, Precipitation titration, Silver electrode, Silver nitrate

\*Some measurement would not be possible depending on optional configuration of system.