Titer of AgNO3 0.1 mol/L

Method for the standardization of 0.1 mol/L silver nitrate usually used for chloride determinations.

Sample	Primary standard Sodium chloride 30 - 50 mg
Substance	NaCl M = 58.44 ; z = 1
Chemicals	Water
Titrant	Silver nitrate c(AgNO3) = 0.1 mol/L;
Standard	
Instruments	DL55;, ST20A, AT261, Printer (HP DeskJet 510)
Accessories	Glass beaker ME-101446, 2 Peristaltic pumps ME-65241
Indication	DM141
Chemistry	
Calculation	
Waste disposal	Filtration; the precipitate (silver chloride) has to be classified as special waste. The filtrate has to be neutralized with sodium hydroxide.
Author	C. De Caro, A. Sartra

Preparation and Procedures

Remarks

Glass beakers are recommended in order to avoid any interference with the weighing due to electrostatic effects.
50 mL diluted sulfuric acid are used to dissolve sodium chloride. Sulfuric acid is dispensed by a pump connected to the ST20A output «Dose». A second pump allows the rinsing of the electrode (ST20A output «Rinse»). This method allows a fully automatic analysis procedure.
The mean value of the titer is automatically stored as part of the setup data by the function TITER.
In order to shorten the titration time you can use the predispensing in the function EQP TITRATION.
The method can easily be modified for manual operation. Enter «Stand 1» as titration stand in the function SAMPLE

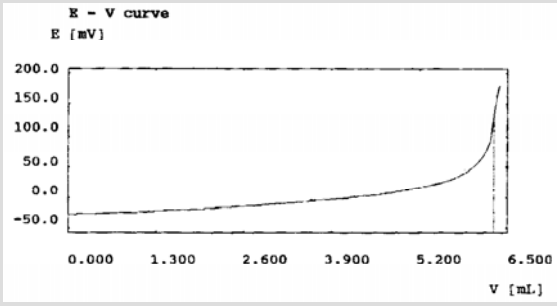
Results

```
METTLER TOLEDO DL55    Titrator   V1.0   Mettler Toledo AG
                       007               Market Support Laboratory

Method       90025 Titer AgNO3 (0.1 mol/L)    01-Jul-1995  12:00
Measured     19-Jul-1995  14:49
User

RESULTS

  No.  ID           Sample size and results

   1   NaCl              0.03324   g
                    R1 = 0.9960                Titer AgNO3
   2   NaCl              0.0337    g
                    R1 = 0.9984                Titer AgNO3
   3   NaCl              0.0363    g
                    R1 = 0.9953                Titer AgNO3
   4   NaCl              0.03067   g
                    R1 = 1.0008                Titer AgNO3
   5   NaCl              0.04068   g
                    R1 = 0.9980                Titer AgNO3
   6   NaCl              0.03654   g
                    R1 = 0.9927                Titer AgNO3


STATISTICS
  Number results       R1       n = 6
  Mean value                    x = 0.9969           Titer AgNO3
  Standard deviation            s = 0.00280          Titer AgNO3
  Rel. standard deviation    srel = 0.281    %

TITER
  Titrant          AgNO3  0.1 mol/L
  New titer                     t =  0.99686
```

Table of measured values

	Volume mL	Increment ml	Signal mV	Charge mV	1st deriv. mV/mL	Time minute
EP1	3.0000		-27.1			0:03
	3.0200	0.0200	-27.3	-0.1	6.5	0:06
	3.0400	0.0200	-27.2	0.0	0.0	0:10
	3.0600	0.0200	-26.1	1	5.6	0:13
	5.[illegible]	0.2	3			
	5.9040	0.1840	42.5	10.9	59.4	2:18
	6.0000	0.0960	50.0	7.5	78.1	2:25
	6.0820	0.0820	58.4	8.4	102.4	2:35
	6.1450	0.0630	67.5	9.0	143.6	2:46
	6.1880	0.0430	75.7	8.3	198.4	2:56
	6.2210	0.0330	84.6	8.9	268.5	3:09
	6.2440	0.0230	92.5	7.9	345.6	3:19
	6.2860	0.0420	101.6	9.1	455.6	3:32
	6.2840	0.0200	117.7	16.1	804.5	3:47
	6.3040	0.0200	133.6	15.9	794.8	4:02
EQP1	6.3240	0.0200	152.2	18.5	927.3	4:18
	6.3440	0.0200	163.7	11.6	578.4	4:33
	6.3780	0.0340	178.8	15.1	442.8	4:49

Titration curve



Method

```
Method    90025     Titer AgNO3 (0.1 mol/L)
          Version   01-Jul-1995  12:00
```

```
Title
   Method ID  . . . . . . . . . . . . . 90025
   Title  . . . . . . . . . . . . . . . Titer AgNO3 (0.1 mol/L)
   Date/time  . . . . . . . . . . . . . 01-Jul-1995  12:00
Sample
   Sample ID  . . . . . . . . . . . . . NaCl
   Entry type . . . . . . . . . . . . . Weight
      Lower limit [g] . . . . . . . . . 0.03
      Upper limit [g] . . . . . . . . . 0.05
   Molar mass M . . . . . . . . . . . . 58.44
   Equivalent number z  . . . . . . . . 1
   Titration stand  . . . . . . . . . . ST20A
      Pump  . . . . . . . . . . . . . . Yes
         Solvent  . . . . . . . . . . . H2SO4
         Volume [mL]  . . . . . . . . . 50.0
      Rinse . . . . . . . . . . . . . . Yes
         Solvent  . . . . . . . . . . . H2O
         Volume [mL]  . . . . . . . . . 20.0
      Conditioning  . . . . . . . . . . No
   Temperature sensor . . . . . . . . . Manual
Stir
   Speed [%]  . . . . . . . . . . . . . 50
   Time [s] . . . . . . . . . . . . . . 20
EQP titration
   Titrant/Sensor
      Titrant . . . . . . . . . . . . . AgNO3
      Concentration [mol/L] . . . . . . 0.1
      Sensor  . . . . . . . . . . . . . DM141
      Unit of meas. . . . . . . . . . . mV
   Predispensing  . . . . . . . . . . . No
   Titrant addition . . . . . . . . . . Dynamic
      dE(set) [mV]  . . . . . . . . . . 8.0
      dV(min) [mL]  . . . . . . . . . . 0.02
      dV(max) [mL]  . . . . . . . . . . 0.2
   Measure mode . . . . . . . . . . . . Equilibrium controlled
      dE [mV] . . . . . . . . . . . . . 0.5
      dt [s]  . . . . . . . . . . . . . 2.0
      t(min) [s]  . . . . . . . . . . . 3.0
      t(max) [s]  . . . . . . . . . . . 15.0
   Recognition
      Threshold . . . . . . . . . . . . 100.0
      Steepest jump only  . . . . . . . No
      Range . . . . . . . . . . . . . . No
      Tendency  . . . . . . . . . . . . Positive
   Termination
      at maximum volume [mL]  . . . . . 10.0
      at potential  . . . . . . . . . . No
      at slope  . . . . . . . . . . . . No
      after number EQPs . . . . . . . . Yes
         n =  . . . . . . . . . . . . . 1
      comb. termination conditions  . . No
   Evaluation
      Procedure . . . . . . . . . . . . Standard
      Potential 1 . . . . . . . . . . . No
      Potential 2 . . . . . . . . . . . No
      Stop for reevaluation . . . . . . No
Calculation
   Formula  . . . . . . . . . . . . . . R=m/(VEQ*c*C)
   Constant . . . . . . . . . . . . . . C=M/(1000*z)
   Decimal places . . . . . . . . . . . 4
   Result unit  . . . . . . . . . . . .
   Result name  . . . . . . . . . . . . Titer AgNO3
   Statistics . . . . . . . . . . . . . Yes
Titer
   Titrant  . . . . . . . . . . . . . . AgNO3
   Concentration [mol/L]  . . . . . . . 0.1
   Formula  t = . . . . . . . . . . . . x
```

```
Report
   Output unit  . . . . . . . . . . . . Printer
   Results  . . . . . . . . . . . . . . No
   All results  . . . . . . . . . . . . Yes
   Raw results  . . . . . . . . . . . . No
   Table of measured values . . . . . . Yes
   Sample data  . . . . . . . . . . . . No
   E - V curve  . . . . . . . . . . . . Yes
   dE/dV - V curve  . . . . . . . . . . No
   d2E/dV2 - V curve  . . . . . . . . . No
   log dE/dV - V curve  . . . . . . . . No
   E - t curve  . . . . . . . . . . . . No
   V - t curve  . . . . . . . . . . . . No
   dV/dt - t curve  . . . . . . . . . . No
```