HIRANUMA APPLICATION DATA	Karl Fischer Titrator	Data No.	KF12	Apr. 19, 2018
Water contents	**Drugs and Medicines – KF Volumetry Powder Sample Sodium Lauryl Sulfate and Benzalkonium Chloride**			

1. Abstract

Water contents of drugs and medicines could be determined by Karl Fischer volumetric titrator. In volumetric titration, titrant have a titer which means the capacity to react with water per 1 mL of titrant. Factor is pre-determined before sample measurement and water content of sample is calculated from consumed titrant volume within sample measurement.

When the sample is solid, firstly sample is measured by direct injection into the cell. Dehydrated methanol is used for titration solvent. The titration solvent may change to a composition suitable for dissolving the sample. If the sample is insoluble to titration solvent, heat-evaporation method is appropriate to these samples.

An example for water contents measurements of sodium lauryl sulfate and benzalkonium chloride performed by direct injection method are introduced here. The measurement method was determined with reference to *Japanese Pharmacopeia*.

Reference

1) Japanese Pharmacopoeia Seventeenth Edition

2. Apparatus and Reagents

(1) Apparatus

Titrator	:	Hiranuma Karl Fischer Volumetric titrator AQV-series
Titration cell	:	Standard Cell, without drain valne P/N D327511-1
Powder funnel	:	Outer diameter of leg less than 13 mm

(2) Reagents

Titrant	:	HYDRANAL Composite 5 (Honeywell)
Titration solvent	:	HYDRANAL Methanol (Honeywell)

3. Procedure

(1) Fill 50 mL of titration solvent into the titration cell as shown in Fig.3.1.

(2) Start blanking to attain stable background.

(3) Put a sample container, powder funnel and spoon on the balance. Record its read (S_1 [g]).

(4) Open the glass stopper of titration cell lid to introduce the sample with powder funnel as shown in Fig.3.2.

(5) Start titration. Measurement parameter is shown in Table 4.1.

(6) Weigh the sample container, powder funnel and spoon again and record its read (S_2 [g]). The difference of (S_1-S_2 [g]) is set as sample size.

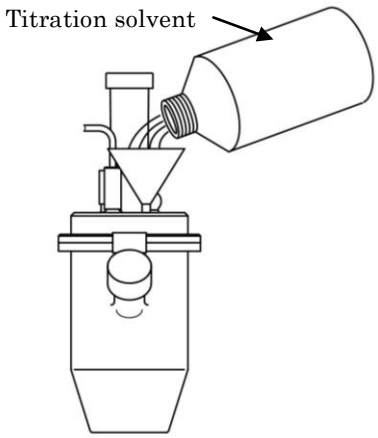

Fig.3.1 Preparation of the reagents

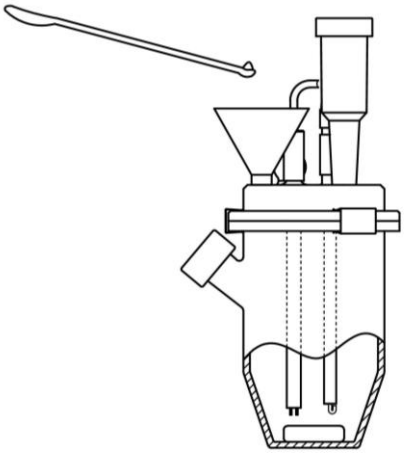

Fig.3.2 Introduction of sample with powder funnel

4. Parameters and results

Table 4.1 Parameters

Condition File		
Cal Mode	0:Sample weight (net) X=(H-b)×F×1000/SIZE	
Interval Time	30	sec
Max Volume	20	mL
Min Feed Vol.	0.01	mL
S.Timer	5	min
KF Factor	5.6884	mg/mL
KF Buret No.	1	
KF Speed(OUT)	12	mL/min
KF Speed(IN)	24	mL/min
Back Ground	OFF	
Sample Size Input	Every Time	
Blank Value	0	mL
Unit Mode	AUTO	
E.P Detection	mV	
C.P Level	150	mV
E.P Level	1	
Auto Interval	0	g

Table 4.2 Results of water content measurement in drugs and medicines

Sample	Sample size (g)	Titrant volume(mL)	Water (mg)	Water content (%)	Statistics result		
Sodium lauryl sulfate	0.5162	0.75	4.266	0.8264	Avg.	0.8271	%
	0.5156	0.75	4.266	0.8274	SD	0.0006	%
	0.5156	0.75	4.266	0.8274	RSD	0.07	%
Benzalkonium chloride	0.1005	1.38	7.850	7.8109	Avg.	7.8673	%
	0.1088	1.50	8.533	7.8428	SD	0.0718	%
	0.1002	1.40	7.964	7.9481	RSD	0.91	%

5. Note

(1) Sampling tools should be dried up well before use.

(2) Purge and fill the titrant homogeneously into the buret.

(3) Organic solvents which have relatively high volume expansion coefficient are used as a constituent of titrant. For accurate measurement, factor titration and sample measurement should be performed at the same room temperature as much as possible.

Keywords：Karl Fischer, Volumetric titration, Pharmacopeia