TITRATION APPLICATION NOTE K-073

Volumetric Karl Fischer titration with Scharlau Aquagent® reagents

Test measurements using Aquagent® Complet 5 and Methanol Fast

This Application Note summarizes a series of test measurements performed with an OMNIS KF Titrator and Karl Fischer reagents Aquagent® Complet 5 and Methanol Fast from Scharlau.

Three series of titer determinations using various water standards were carried out. The results obtained using different water standards were found to lie in a similar range. The reproducibility of the results was determined to be very good.

Using an OMNIS titration system from Metrohm and the Scharlau Karl Fischer reagents, titer determinations can be carried out quickly without any decline in the reproducibility of results.

Metrohm

REAGENTS

AQ00151000 – Aquagent® Complet 5

AQ00111000 – Aquagent® Methanol Fast

STANDARDS

Three different water standards have been used for the tests performed in this study:

1 Water standard with a water content of approximately 10.0 mg/g («water standard 10»)

2 Sodium tartrate dihydrate with a water content of approximately 15.7%

3 Deionized water

EXPERIMENTAL

A 10-fold titer determination was carried out with both water standards and the deionized water.

The sample sizes were varied for water standard 10 (between 0.5 g and 4.0 g) as well as for the sodium tartrate dihydrate (between 0.077 g and 0.114 g). A constant sample size of 25 µg was used for the deionized water.

The water standard 10 was added with a glass syringe. To add the sodium tartrate dihydrate, a weighing boat (6.2412.000) was used. The deionized water was injected into the titration cell with a microliter syringe.

RESULTS

The following table shows the results of three titer determination series using using Aquagent® Complet 5 and Methanol Fast reagents from Scharlau.

Table 1. Results of the titer determination series (n = 10) with three water standards.

Standard	Titer in mg/mL	s(abs) in mg/mL	s(rel) in %
1	5.3936	0.02248	0.09
2	5.3781	0.00485	0.16
3	5.3459	0.00873	0.42

CONCLUSION

The titer determinations were both fast and reproducible. The relative standard deviations were very low, especially for the water standard 10 and the sodium tartrate dihydrate.

Methanol Fast contains additives to accelerate the titration, therefore it is recommended to use the method parameters suitable for two-component reagents (Table 2).

Table 2. List of suitable method parameters for two-component reagents in OMNIS.

Parameter	Value
Dynamics	300 mV
Max. rate	max
Min. volume increment	min
Ipol	50 µA
EP	250 mV

Analytes:	**Moisture/water**
Matrix:	**Other**
Method:	**Karl Fischer Titration**
Industry:	**Chemical; Food & beverage; Pharmaceutical; R&D (Academia)**
Standards:	**–**

Titration Application Note K-073, Version 1 – 2023-02