

Analytix *LabInfo*



HYDRANAL®-Water Standards

Traceable to NIST SRM 2890

HYDRANAL®-Water Standards can be used for the titer determination of volumetric Karl Fischer reagents, to control coulometric Karl Fischer instruments and, most importantly, for the quality control of Karl Fischer instruments in general as it relates to ISO 9001-9003 and other standard procedures.

Calibration, validation and control of analytical instruments and reagents are central requirements in regular Quality Management systems. In the case of Karl Fischer titrations, the most widely used method for water determination, a known amount of water is required. Pure water can be used, but the amounts needed (10 mg for volumetry, and 100 µg - 1 mg for coulometry) are difficult to weigh.

We recommend **HYDRANAL®-Water Standards** with an exactly confirmed water content

- for titer determination
- for monitoring precision and accuracy
- for validation and inspection of KF titrators according to ISO 9000, GMP, GLP and FDA guidelines

Traceability to a national standard or to a SI unit is often required in these guidelines. Three of our liquid **HYDRANAL®-Water Standards**, one for volumetry and two for coulometry, as well as one of our solid **HYDRANAL® Standards** are traceable to the NIST standard reference material SRM 2890, Water Saturated Octanol. «NIST» stands for the National Institute of Standards and Technology of the USA.

Liquid **HYDRANAL®-Water Standards**

HYDRANAL®-Water Standards consist of a solvent mixture with specific composition and precisely determined water content. The exact amount of water can be found on a Certificate of Analysis which is enclosed in each product package. **HYDRANAL®-Water Standards** are filled under Argon in 4 mL or 8 mL glass ampoules. The humidity-proof packaging allows for a minimum storage of five years. Each box contains 10 ampoules.

General Instructions for use

Opening an ampoule directly before a measurement will reduce the risk of atmospheric moisture entering the ampoule and falsifying results (depending on local humidity conditions). We recommend the use of glass syringes since most plastic syringes can store or release a certain amount of water over time. It is common practice to flush each syringe initially with approximately 1 mL of **HYDRANAL®-Water Standard**, then draw the whole remaining volume into the syringe. This will reduce exposure of the standard to atmospheric moisture.

34849 HYDRANAL®-Water Standard 10.0

Standard for volumetric Karl Fischer titration. This standard is traceable to NIST SRM 2890.

34828 HYDRANAL®-Water Standard 1.00

Standard for coulometric Karl Fischer titration. This standard is also traceable to NIST SRM 2890.

Although coulometry is considered an absolute method, not all titrated values are necessarily correct. Air humidity, electrode poisoning, or sample matrix conditions can influence the results. It is therefore necessary to test the system with known water quantities and check the recovery data. This validation of the instrument should be performed once the titration vessel has been freshly charged with reagents. To monitor for interferences caused by the sample matrix, a



Picture 1 Liquid **HYDRANAL®-Water Standards**

control test should be done immediately after a sample was analyzed. In either case the theoretically added amount of water should correspond to the experimentally titrated amount of water; for an added amount of 1000 µg water, the deviation should not exceed 50 µg (better 30 µg).

34847 HYDRANAL®-Water Standard 0.10

Standard for coulometric Karl Fischer titration. This standard is also traceable to NIST SRM 2890. It can be used in the same way for verification of coulometric measurements. We recommend the use of this standard when determining very small absolute amounts of water (approx. 100 µg). An excellent working technique is required, otherwise the results may be too high. This also applies for the results of the sample measuring.

34813 HYDRANAL®-Standard 5.00

Standard for volumetric Karl Fischer titration with water content of 5.00 ± 0.02 mg/mL.

This liquid calibration standard contains a mixture of solvents of a defined partial pressure of water and is therefore stable under normal atmospheric conditions.

34802 HYDRANAL®-Water-in-methanol Standard 5.00

Standard for volumetric back titration according to Karl Fischer with water content of 5.00 ± 0.02 mg/mL.

This standardized methanol is hygroscopic and can take up atmospheric moisture.

All liquid **HYDRANAL® Standards** should be dosed using glass syringes, weighed before and after dosage.

HYDRANAL® Solid Standards

NEW 34696 HYDRANAL®-Standard sodium tartrate dihydrate

Primary standard for volumetric Karl Fischer titration with water content of 15.66 ± 0.05 %. This standard is traceable to NIST SRM 2890. **HYDRANAL®-Standard sodium tartrate dihydrate** remains stable under normal conditions and does not lose or adsorb moisture. It is presented with a Certificate of Analysis in a finely powdered form that dissolves relatively quickly in methanol, a

although its solubility is limited. This is the primary standard for Karl Fischer applications.

34803 HYDRANAL®-Standard sodium tartrate dihydrate

Primary standard for volumetric Karl Fischer titration with water content of 15.66 ± 0.05 %.

34748 HYDRANAL®-Water Standard KF-Oven

Solid standard for the control of Karl Fischer ovens using coulometric and volumetric water determination. This standard contains 5.55 ± 0.05 % chemically combined water. The exact water content of each lot is displayed in the enclosed Certificate of Analysis. This standard may be used to verify the results of a Karl Fischer oven system. If the experimentally titrated amount of water differs from the added amount of water, the function of the connected volumetric or coulometric Karl Fischer titrator should be checked using liquid HYDRANAL®-Water Standards.

NEW 37943 Fastrate™ volumetric 10 mg tablets

We are exclusively distributing Fastrate™ volumetric 10 mg, a novel water standard in tablet form to support volumetric Karl Fischer titrations. The tablets are manufactured and packaged in single use, individually sealed blister cards and are supplied with a Certificate of Analysis in each carton. A $10.00 \text{ mg} \pm 3$ % water content meets the minimum moisture content required by pharmacopoeia standards (e.g. USP General Chapter 921. Water Determination). Fastrate™ volumetric 10 mg is available in a pack of 30 tablets.

Usage

The Fastrate™ volumetric 10 mg tablets simplify your instrument calibration. Open a blister and put the water standard tablet directly into your volumetric titration vessel. The deviation from the water content described in the Certificate of Analysis does not exceed 3 % (w/w). For accurate control, the system should be checked regularly using HYDRANAL®-Water standard 10.0.



Picture 2 + 3 Fastrate™ tablets and box

U.S. Patent Applications 10/399,117 and 10/793,722 and foreign equivalents apply.

Technical support

We'll be glad to provide you with support for the analysis of your samples based on our twenty years of experience with Karl Fischer titration. We can suggest a solution to your analytical problem and, if necessary, develop an individual analytical method for you. Our comprehensive application collection makes daily work easier for HYDRANAL® users.

Just call us! We'll be pleased to answer any questions regarding sample analysis using the Karl Fischer method and on HYDRANAL® reagents.

Table Product Range

Cat. No.	Product	Description	Package Size
34849	HYDRANAL®-Water Standard 10.0	Standard for volumetric KF titration 1 g (1mL) contains 10.0 mg = 1.00 % water at 20 °C Contains 10 glass ampoules of 8 mL Traceable to NIST SRM 2890	80 mL
34828	HYDRANAL®-Water Standard 1.00	Standard for coulometric KF titration 1 g (1mL) contains 1.00 mg = 0.10 % water at 20 °C Contains 10 glass ampoules of 4 mL Traceable to NIST SRM 2890	40 mL
34847	HYDRANAL®-Water Standard 0.10	Standard for coulometric KF titration 1 g contains 0.10 mg = 0.01 % water Contains 10 glass ampoules of 4 mL Traceable to NIST SRM 2890	40 mL
34813	HYDRANAL®-Standard 5.00	Standard for titer determination of volumetric reagents. Water content: 5.00 ± 0.02 mg/mL at 20 °C	100 mL, 500 mL
34802	HYDRANAL®-Water-in-methanol-Standard 5.00	Standard for volumetric back titration according to Karl Fischer. Water content: 5.00 ± 0.02 mg/mL	1 L
34696	NEW HYDRANAL®-Standard Sodium tartrate dihydrate	Primary standard for volumetric KF titration Water content: 15.66 ± 0.05 % Traceable to NIST SRM 2890	25 g
34803	HYDRANAL®-Standard-Sodium tartrate dihydrate	Primary standard for volumetric KF titration Water content: 15.66 ± 0.05 %	100 g
34748	HYDRANAL®-Water Standard KF-Oven	Solid standard for control of KF Ovens Water content: 5.55 ± 0.05 %	10 g
37943	NEW Fastrate™ volumetric 10 mg tablets	Solid standard tablets for titer determination of volumetric reagents. Water content: $10.00 \text{ mg} \pm 3$ %	1 pack of 30 tablets

The general terms of sale of the current Laboratory Chemicals Catalog apply.



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