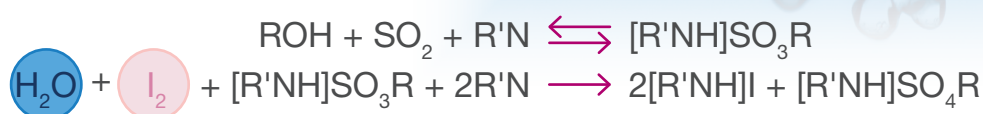


Aquagent® Complet 5 Aquagent® Methanol Fast

New
Formulation

Karl Fischer titration has been the globally accepted method for water determination since the early 20th century. Karl Fischer titration is based on the Bunsen reaction, a two-phase reaction with a stoichiometric relationship between the I_2 consumed and the amount of water in the sample.



pH
5-7

ROH = Alcohol, typically methanol
R'N = Base

The first KF reagents developed contained pyridine in their formulation, supposedly essential for the reaction. Later experiments showed that pyridine only acted as a buffer substance and could be replaced by other basic compounds capable of performing the same function but being less toxic.

For this reason, pyridine-free Karl Fischer reagents, as well as our Aquagent®, contain imidazole rather than pyridine. Imidazole is a less toxic base that has good buffering capacity and allows to obtain stable titration end points quickly.

Volumetric titration is the method of choice for samples with a higher water content (0.1% - 100%). In volumetric titrations, water content is determined from the volume of the Karl Fischer reagent required to reach the end point of the reaction. This end point is indicated by an excess of iodine and is measured potentiometrically.

Volumetric titrations can be performed with one or two-component reagents.

One-Component Reagents

In one-component Karl Fischer volumetric titration, all the substances necessary for the reaction are included in a single reagent: the titrant. One-component reagents are very easy to use and allow for greater flexibility in choosing the most suitable solvent for each type of sample. On the other hand, due to component reactivity, the reagents of one-component reagents must be re-titrated frequently.

The most widely used one-component reagent is that which is capable of titrating 5 mg of water per millilitre of component.

Scharlab has improved its Aquagent® Complet 5 one-component reagent. This improvement not only includes reagent reformulation, but also substantial changes in the manufacturing process, which allow to obtain a much more robust reagent, with greater consistency between batches and a fast reaction speed.

To demonstrate this, we have carried out various tests in our laboratory (see next page).



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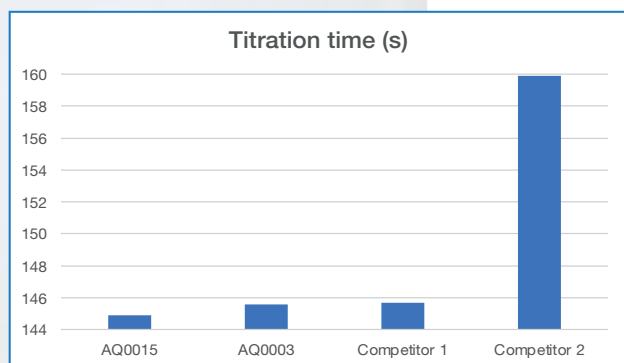
Chemicals · Karl Fischer



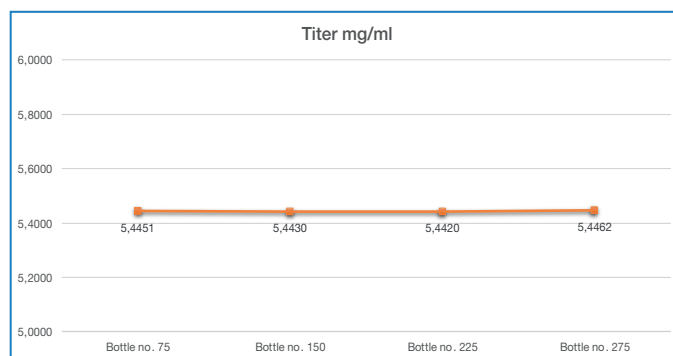
One of the most important features in this type of reagents is product precision. Five measurements of a water standard were made with both our new Aquagent® Complet 5 and competitors' products. The table below shows the standard deviations for the measurements, which lead us to the conclusion that the new formulation is better than our previous formulation and improves the others on the market.

	Scharlau AQ0015 New formulation	Scharlau AQ0003	Competitor 1	Competitor 2
Average titer of 5 measurements	5.4334	5.4709	5.1517	4.2153
Standard deviation for 5 measurements	0.0147	0.0278	0.0224	0.0167

Another important point when choosing a one-component Karl Fischer reagent is the titration speed. In the following table, we can see that the titration velocity of the new Aquagent® Complet 5 is one of the fastest on the market, improving on that of our previous formulation.



Additionally, the new, more robust manufacturing process, allows us to guarantee greater consistency between batches and within the same batch. Within a single batch, the titer for all bottles remains constant.



Scharlau's new Aquagent® Complet 5 formulation offers a much more stable product over time, with less titer variation, even in already opened bottles.

	New AQ0015 formulation	Previous AQ0003 Scharlau
Titer of recently opened bottle (mg/ml)	5.4334	5.4709
Titer of same bottle after two weeks (mg/ml)	5.4239	5.5232
Variation	0.17%	1%

Furthermore, internal studies demonstrate the versatility of the new formulation, obtaining excellent results even with very complex matrices.

Scharlab recommends using the new Aquagent® Complet 5 together with Aquagent® Methanol Fast to reduce stabilisation time, improve reaction rate and avoid the formation of precipitates when the solvent interacts with the sample. The use of both products allows the user to make more measurements with the same time and to obtain more reliable results.

Download here the leaflet



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