
Application Note AN-K-068

# Water content determination and acid-base titration in parallel

## Reliable and reproducible water content determination in parallel to an aqueous potentiometric titration

The water content determination by volumetric Karl Fischer titration is one of the most important analyses worldwide. Using an OMNIS system consisting of an OMNIS Titrator and an OMNIS Sample Robot, the fully automatic analysis of water content is possible in various products and matrices. The OMNIS Sample Robot is capable of running several different titrations in parallel.

In this Application Note, we present the results of a volumetric Karl Fischer titration run in parallel to an aqueous acid-base titration on the same system. The water content is not influenced by the parallel running aqueous titration, allowing the combination of potentiometric titrations and Karl Fischer titrations on the same automated system.

Find more information in the video

## SAMPLE AND SAMPLE PREPARATION

This application is demonstrated on certified sodium tartrate dihydrate with a water content of 15.71% ± 0.07%. No sample preparation is required.

## EXPERIMENTAL

The determinations are carried out on an automated system consisting of an OMNIS Sample Robot S with Dis-Cover functionality, OMNIS Dosing Module, and an OMNIS Professional Titrator (equipped with a double Pt-wire electrode for automated systems for KFT and a dEcotrode plus for acid-base titration).
The sample is weighed into the sample beaker, which is then covered with the DIS-cover lid and placed on the rack. The OMNIS Sample Robot automatically brings the beaker to the workstation and uncovers it just prior to the analysis. A solvent mixture consisting of methanol, imidazole, and sulfur dioxide is added automatically and the sample is titrated with a single-component titrant to the endpoint.
In parallel, an aqueous acid-base titration was performed on a second workstation on the same OMNIS Sample Robot.

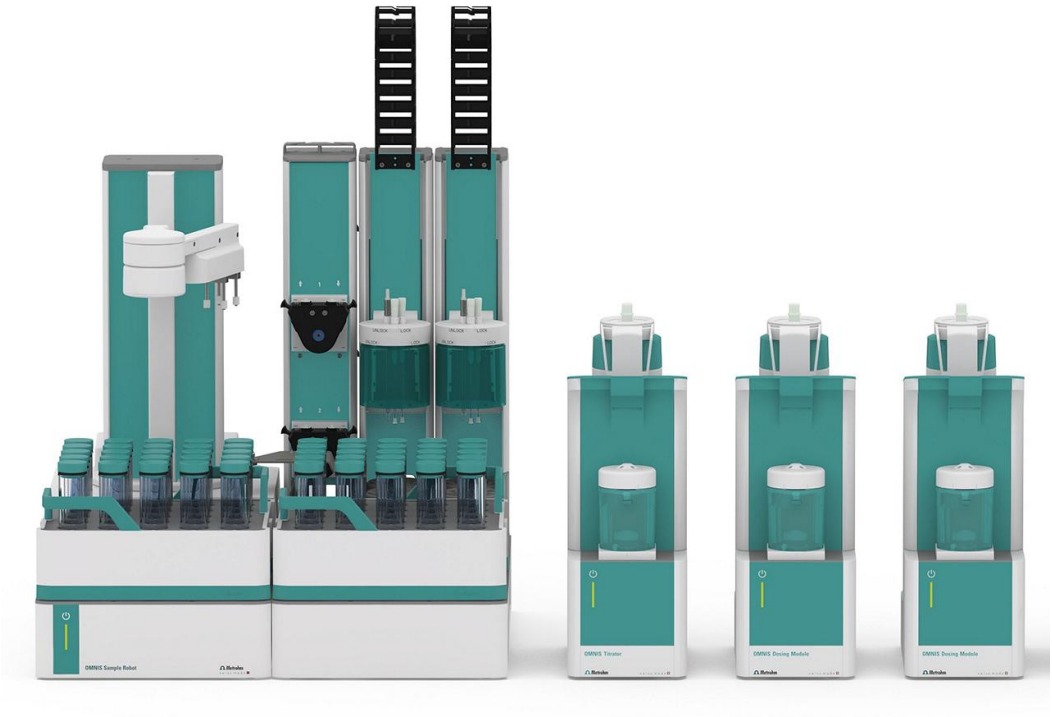

**Figure 1.** Automated OMNIS System for the parallel volumetric Karl Fischer titration and aqueous acid-base titration consisting of an OMNIS Sample Robot, OMNIS Dosing Module, and OMNIS Titrator Professional equipped with a Pt-wire electrode for automated systems and a dEcotrode plus.

## RESULTS

As the focus is on the reproducibility of the KF results while performing acid-base titration in parallel, we only present the KFT results here. Reproducible results for the water content are obtained. For the tested sodium tartrate dihydrate a water content of 15.67% (n = 6, SD(rel) = 0.3%) is found, which is well within the given certified water content.

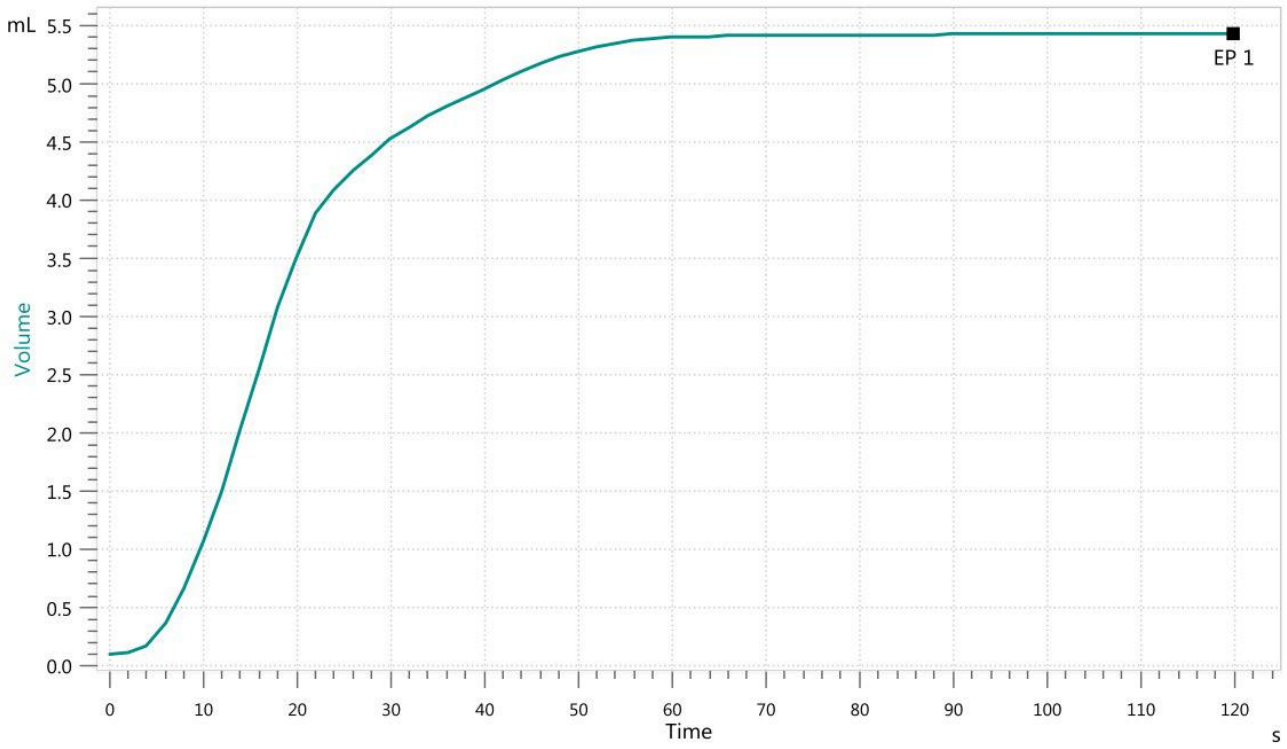


**Figure 2.** Titration curve of the determination of the water content in sodium tartrate dihydrate.

## CONCLUSION

Karl Fischer Titration is a precise and reliable method for the determination of the water content of a sample. This study shows that a parallel determination of the water content besides potentiometric aqueous acid-base titration on an automated OMNIS system is possible. The potentiometric determination does not interfere with the Karl Fischer titration.

A reliable water content determination is possible while running aqueous titrations in parallel with Karl Fischer titration on the same OMNIS system.

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