
Lactose — Determination of water content — Karl Fischer method

*Lactose — Détermination de la teneur en eau — Méthode de Karl
Fischer*





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ISO 12779|IDF 227 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF). It is being published jointly by ISO and IDF.

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IDF (the International Dairy Federation) is a non-profit organization representing the dairy sector worldwide. IDF membership comprises National Committees in every member country as well as regional dairy associations having signed a formal agreement on cooperation with IDF. All members of IDF have the right to be represented on the IDF Standing Committees carrying out the technical work. IDF collaborates with ISO in the development of standard methods of analysis and sampling for milk and milk products.

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Lactose — Determination of water content — Karl Fischer method

1 Scope

This International Standard specifies a method for the determination of the water content of lactose by Karl Fischer (KF) titration.

2 Principle

The test sample is directly titrated with a commercially available two-component Karl Fischer reagent. The water content is calculated from the amount of reagent used.

Titration at a temperature of approximately 40 °C gives shorter titration times and sharper end points. Only at this or higher temperatures is the use of a one-component Karl Fischer reagent (3.1) recommended.

3 Reagents

Use only reagents of recognized analytical grade, unless otherwise specified, and only distilled or demineralized water or water of equivalent purity. Avoid absorption of moisture from the environment.

3.1 Karl Fischer (KF) reagent¹⁾ The KF reagent is a commercially available pyridine-free two-component reagent consisting of a titration component (3.2) and a solvent component (3.3). The titration component (3.2) is a methanolic solution of iodine and the solvent component (3.3) is a methanolic solution of sulfur dioxide and an appropriate base (e.g. imidazole).

Alternatively, a pyridine-free one-component KF reagent can also be used which only consists of a titration component. The titration component (3.2) is a solution of iodine, sulfur dioxide and an appropriate base (e.g. imidazole) in a suitable solvent (e.g. diethylene glycol monoethyl ether). The solvent component (3.3) is methanol (3.5). This combination of a one-component titration reagent and methanol is only recommended if the titration is carried out at a temperature of approximately 40 °C or higher.

3.2 Titration component. The titration component of the KF reagent (3.1) shall have a water equivalent of approximately 2 mg/ml of water.

A KF reagent with a water equivalent of approximately 5 mg/ml of water is also possible if a KF apparatus with a burette of capacity 5 ml is used (4.1).

3.3 Solvent component. The solvent component of the KF reagent as specified in 3.1.

3.4 Water standard, $w(\text{H}_2\text{O}) = 10 \text{ mg/g}$.

1) Hydranal[®]-Titrant 2/Hydranal[®]-Solvent from Sigma-Aldrich and apura[®] Titrant 2/apura[®] Solvent from Merck are examples of commercially available two-component systems. Hydranal[®]-Composite 2 from Sigma-Aldrich and apura[®] CombiTitant 2 from Merck are examples of commercially available one-component reagents. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO and IDF of these products.