



Water determination in whole milk powder

HYDRANAL™ Application of the Month – JULY 2017

Water content is an important feature in the production of milk and dairy products, from both technological and economic perspectives. Karl Fischer titration is an easy solution for water determination and ensuring milk products are both legal and safe in terms of their water content.

Milk is a very good medium for microbial growth. There are a few methods to extend its shelf life: pasteurization, sterilization or partial removal of water leading to milk powder. Milk powder has also other advantages besides longer shelf life – it doesn't need to be refrigerated and is more economical in transportation.

Depending on the type of milk used for the drying process, different types of milk powders can be produced: whole milk powder, skimmed milk powder, partially skimmed milk powder or cream powder. Each has a different specification for milk fat content, however for all of them water content needs to be below 5% to ensure food safety.

In the case of dry whole milk, water determination can be carried out directly. The titration process takes approximately 5 minutes, and can be reduced to 2 minutes, if carried out at 50°C. Standard volumetric reagents with titer 5 can be used.

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Procedure for volumetric one-component titration at elevated temperature:

Add 20 mL Hydranal™-Methanol dry or Hydranal-Methanol Rapid to the titration vessel, heat to 50°C, and titrate to dryness using Hydranal-Composite 5.

Accurately weigh-in by difference approximately 1 g of sample and titrate with Hydranal-Composite 5.

Procedure for volumetric two-component titration at elevated temperature:

Add 20 mL Hydranal-Solvent to the titration vessel, heat to 50°C, and titrate to dryness using Hydranal-Titrant 5.

Accurately weigh-in by difference approximately 1 g of sample and titrate with Hydranal-Titrant 5.

Hydranal-Water Standard 10.0, Hydranal-Water Standard 1.0, and Hydranal-Standard Sodium Tartrate Dihydrate are suitable for determination of the titer or control of the volumetric determination.



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VOLUMETRIC REAGENTS

[34805](#) HYDRANAL-Composite 5

[34741](#) HYDRANAL-Methanol Dry

[37817](#) HYDRANAL-Methanol Rapid

[34801](#) HYDRANAL-Titrant 5

[34800](#) HYDRANAL-Solvent

WATER STANDARDS

[34849](#) HYDRANAL-Water Standard 10.0

[34425](#) HYDRANAL-CRM Water Standard 10.0

[34828](#) HYDRANAL-Water Standard 1.0

[34426](#) HYDRANAL-CRM Water Standard 1.0

[34696](#) HYDRANAL-Standard Sodium
Tartrate Dihydrate

[34424](#) HYDRANAL-CRM Sodium Tartrate
Dihydrate



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AUXILIARIES

[34241](#) HYDRANAL-Molecular Sieve 0.3 nm

[34788](#) HYDRANAL-Humidity Absorber



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