

Титрование по Карлу Фишеру

Технические характеристики

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Karl Fischer titration is the globally accepted method for determining water content since the early 20th century. It is based on the Bunsen reaction, a two-phase reaction with a stoichiometric relationship between the consumed I₂ and the amount of water in the sample. The initial KF reagents contained pyridine in their formulation, believed to be essential for the reaction. Subsequent experiments demonstrated that pyridine merely acted as a buffering substance and could be substituted with other basic compounds capable of performing the same function but with lower toxicity. For this reason, Karl Fischer reagents without pyridine, such as our Aquagent®, contain imidazole instead. Imidazole is a non-toxic base with good buffering capacity, allowing for the rapid attainment of stable endpoints in the titration.



Aquagent® buffer, free from pyridine, buffer capacity 5 mmol acid/ml

- Density: ~ 0,88 g/cm³
- Flash pt. 11 °C
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H360D - H370 - H314
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405 - P501a
- Tariff number: 3822 00 00 00
- Applications: analytical chemistry, laboratory reagent.

SPECIFICATIONS
contains methanol

Volume

x 500 ml

Reference

[AQ00090500](#)

Packaging

x 500 ml :: Glass bottle



Aquagent® Complet 2, free from pyridine, one-component reagent for volumetric Karl Fischer titration

- Density: 1,115 g/cm³
- Boiling point: 184°C
- Flash pt. 93°C
- Ignition temp.: 190°C
- ADR: 8 C9 III UN 1760
- IMDG: 8 III UN 1760
- IATA/ICAO: 8 III UN 1760
- GHS-signal word: Danger
- GHS-H sentences: H314 - H360D
- GHS-P sentences: P260 - P303+P361+P353 - P305+P351+P338 - P310 - P405 - P501a
- Appearance: Marronoso

SPECIFICATIONS

1 ml = 2 mg H₂O approx.

Contains imidazole, sulfur dioxide and diethyleneglycol monoethyl ether Air humidity will change the titre Protect from moisture

Volume

x 500 ml

Reference

[AQ00330500](#)

Packaging

x 500 ml :: Glass bottle

Volume

x 1 l

Reference

[AQ00331000](#)

Packaging

x 1 l :: Glass bottle

Volume

x 2,5 l

Reference

[AQ00332500](#)

Packaging

x 2,5 l :: Glass bottle



Aquagent® Complet 2, free from pyridine, one-component reagent for volumetric Karl Fischer titration

- Density: 1,115 g/cm³
- Boiling point: 184°C
- Flash pt. 93°C
- Ignition temp.: 190°C
- ADR: 8 C9 III UN 1760
- IMDG: 8 III UN 1760
- IATA/ICAO: 8 III UN 1760
- GHS-signal word: Danger
- GHS-H sentences: H314 - H360D
- GHS-P sentences: P260 - P303+P361+P353 - P305+P351+P338 - P310 - P405 - P501a
- Appearance: Marronoso

SPECIFICATIONS

1 ml = 2 mg H₂O approx.

Contains imidazole, sulfur dioxide and diethyleneglycol monoethyl ether Air humidity will change the titre Protect from moisture

Volume

x 500 ml

Reference

[AQ00330500](#)

Packaging

x 500 ml :: Glass bottle

Volume

x 1 l

Reference

[AQ00331000](#)

Packaging

x 1 l :: Glass bottle

Volume

x 2,5 l

Reference

[AQ00332500](#)

Packaging

x 2,5 l :: Glass bottle



Aquagent® Complet 5, free from pyridine, for volumetric Karl Fischer titration

- Density: 1,16 g/cm³
- GHS-signal word: Danger
- GHS-H sentences: H315 - H319 - H351 - H360Df - H373
- GHS-P sentences: P260 - P280 - P305+P351+P338 - P321 - P405 - P501a
- Tariff number: 3822 00 00 00
- Appearance: Líquido marronoso

SPECIFICATIONS

1 ml = 5 mg H₂O approx.

Air humidity will change the titre Protect from moisture



Aquagent® Complet 5K, free from pyridine, for volumetric Karl Fischer titration (ketones, aldehydes)

- Density: 1,157 g/cm³
- Boiling point: 184°C
- Flash pt. 146°C
- Ignition temp.: 225°C
- Vapour pressure: 0,4 hPa
- ADR: 8 C9 III UN 1760
- IMDG: 8 III UN 1760
- IATA/ICAO: 8 III UN 1760

- GHS-signal word: Danger
- GHS-H sentences: H314 - H360D
- GHS-P sentences: P260 - P303+P361+P353 - P305+P351+P338 - P310 - P405 - P501a
- Tariff number: 3822900000
- Appearance: Marronoso

SPECIFICATIONS

1 ml = 5 mg H₂O approx.

Contains imidazole, sulfur dioxide and diethyleneglycol monoethyl ether Air humidity will change the titre Protect from moisture



Aquagent® Coulometric A, anolyte for coulometric Karl Fischer titration

- Density: 1,08 g/cm³
- Boiling point: 62°C
- Flash pt. 10°C
- Ignition temp.: 455°C
- Vapour pressure: 210 hPa
- ADR: 3 FTC II UN 3286
- IMDG: 3 II UN 3286
- IATA/ICAO: 3 II UN 3286
- GHS-signal word: Danger
- GHS-H sentences: H225 - H302 - H311+H331 - H314 - H351 - H360D - H370 - H372
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405 - P501a
- Tariff number: 3822 00 00 00
- Appearance: Amarillo pálido

SPECIFICATIONS

water content: max. 50 ppm

Suitability for coulometric KF titration: passes test
Suitable for cells with diaphragm Protect from moisture



Aquagent® Coulometric AD, anolyte for coulometric Karl Fischer titration

- Density: 0,91 g/cm³
- Flash pt. 10 °C
- ADR: 3 FTC II UN 3286
- IMDG: 3 II UN 3286
- IATA/ICAO: 3 II UN 3286
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H314 - H360D - H370 - H373
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405 - P501a
- Tariff number: 3822 90 00 00
- Appearance: Amarillento

SPECIFICATIONS

Suitability for volumetric Karl Fischer titration: passes test



Aquagent® Coulometric AG Oven, anolyte for coulometric Karl Fischer titration with oven

- Density: 0,95 g/cm³
- Flash pt. 10 °C
- ADR: 3 FTC II UN 3286
- IMDG: 3 II UN 3286
- IATA/ICAO: 3 II UN 3286
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H314 - H360D - H370
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405 - P501a
- Tariff number: 3822 90 00 00
- Appearance: Amarillento

SPECIFICATIONS

Suitability for coulometric KF titration: passes test
water content: max. 50 ppm



Aquagent® Coulometric AG, anolyte for coulometric Karl Fischer titration, suitable for cells with & without diaphragm

- Density: 0,93 g/cm³
- Flash pt. 10°C
- ADR: 3 FTC II UN 3286
- IMDG: 3 II UN 3286
- IATA/ICAO: 3 II UN 3286
- GHS-signal word: Danger
- GHS-H sentences: H225 - H301+H311+H331 - H314 - H360D - H370 - H373
- GHS-P sentences: P210 - P301+P310 - P303+P361+P353 - P305+P351+P338 - P370+P378 - P405 - P501a
- Tariff number: 3822 00 00 00
- Appearance: Amarillento

SPECIFICATIONS

Suitability for coulometric KF titration: passes test
water content: max. 50 ppm

Protect from moisture It has a water capacity of approx. 1000mg/100ml.



Aquagent® Coulometric AK, anolyte for coulometric Karl Fischer titration

- Density: 1,15 g/cm³
- Flash pt. 10°C
- ADR: 3 FC II UN 2924
- IMDG: 3 II UN 2924
- IATA/ICAO: 3 II UN 2924
- GHS-signal word: Danger

- GHS-H sentences: H225 - H302 - H314 - H351 - H360D - H372
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405 - P501a
- Appearance: Amarillento

SPECIFICATIONS

Suitability for coulometric KF titration: passes test

Protect from moisture



Aquagent® Coulometric CG, catholyte for coulometric Karl Fischer titration

- Density: 1,070
- Flash pt. 10 °C
- ADR: 3 FC III UN 2924
- IMDG: 3 III UN 2924
- IATA/ICAO: 3 III UN 2924
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H315 - H318 - H370
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405 - P501a
- Tariff number: 3822 00 00 00
- Appearance: Amarillento

SPECIFICATIONS

Suitability for coulometric KF titration: passes test

water content: max. 50 ppm

Contains methanol Suitable for cells with diaphragm Protect from moisture



Aquagent® Coulometric CG-K, catholyte for coulometric Karl Fischer titration

- Density: 1,095
- Boiling point: 100°C
- Flash pt. 74°C
- ADR: 8 C9 III UN 1760
- IMDG: 8 III UN 1760
- IATA/ICAO: 8 III UN 1760
- GHS-signal word: Danger
- GHS-H sentences: H312 - H315 - H318 - H360Df - H373
- GHS-P sentences: P280 - P305+P351+P338 - P310 - P321 - P405 - P501a
- Tariff number: 3822 00 00 00
- Appearance: Amarillento

SPECIFICATIONS

Suitability for coulometric KF titration: passes test

Suitable for cells with diaphragm Protect from moisture



Aquagent® Coulometric Oil

- Density: 0,98 g/cm³
- Flash pt. 8 °C
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- GHS-signal word: Danger
- GHS-H sentences: H225 - H314 - H301+H311+H331 - H351 - H360D - H370 - H372 - -
- GHS-P sentences: P210 - P301+P310 - P303+P361+P353 - P305+P351+P338 - P370+P378
- P405 - P501a
- Tariff number: 3822 90 00 00

SPECIFICATIONS

Suitability for coulometric KF titration: passes test

Contains methanol, chloroform, imidazole, xylol, sulfur dioxide

Suitable for cells with diaphragm

Protect from moisture



Aquagent® Medium K, free from pyridine, solvent for volumetric Karl Fischer titration (ketones, aldehydes)

- Density: 1,35 g/cm³
- Boiling point: 60 °C
- Flash pt. > 100 °C
- ADR: 6.1 T1 II UN 2810
- IMDG: 6.1 II UN 2810
- IATA/ICAO: 6.1 II UN 2810
- GHS-signal word: Danger
- GHS-H sentences: H301 - H310 - H330 - H372 - H351 - H361d - H315 - H319 - -
- GHS-P sentences: P260 - P301+P310 - P320 - P361 - P405 - P501a
- Tariff number: 3822 00 00 00
- Applications: analytical chemistry, laboratory reagent.

SPECIFICATIONS

For use with: Aquagent® Complet 5K (AQ0004)

contains trichloromethane and 2-chloroethanol



Aquagent® Methanol Fast

- Density: 0,82 g/cm³
- Solub. in water: (20 °C): miscible
- Flash pt. 11 °C
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H360D - H370 - H314
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405
- P501a
- Tariff number: 3822 00 00 00

SPECIFICATIONS

For use with: Aquagent® Complet 5 (AQ0003) Aquagent® Complet 2 (AQ0007)

Reagent for accelerated volumetric titration

Contains imidazole, sulfur dioxide and methanol



Aquagent® Solvent CM, solvent-component for volumetric Karl Fischer titration in oils and fats

- Density: 1,25 g/cm³
- Boiling point: 60 - 65 °C
- Flash pt. > 100 °C
- ADR: 6.1 T1 II UN 2810
- IMDG: 6.1 II UN 2810
- IATA/ICAO: 6.1 II UN 2810
- GHS-signal word: Danger
- GHS-H sentences: H311 - H331 - H360D - H370 - H372 - H351 - H314 - H302 - -
- GHS-P sentences: P260 - P303+P361+P353 - P305+P351+P338 - P310 - P405 - P501a
- Tariff number: 3822 00 00 00
- Applications: analytical chemistry, for water determination.

SPECIFICATIONS

For use with: Aquagent® Titrant 5 (AQ0001) Aquagent® Titrant 2 (AQ0006)

Contains imidazole, sulfur dioxide, chloroform and methanol



Aquagent® Solvent Oil, solvent-component for volumetric Karl Fischer titration in oils and fats, free from halogenated hydrocarbons

- Density: ~ 0,835 g/cm³
- Boiling point: 63 °C
- Flash pt. 17 °C
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- GHS-signal word: Danger
- GHS-H sentences: H225 - H360D - H370 - H302 - H332 - H315
- GHS-P sentences: P210 - P241 - P303+P361+P353 - P370+P378 - P405 - P501a
- Tariff number: 3822 00 00 00
- Applications: analytical chemistry, laboratory reagent.

SPECIFICATIONS

For use with: Aquagent® Titrant 5 (AQ0001) Aquagent® Titrant 2 (AQ0006) 1-hexanol and methanol. Contains imidazole, sulfur dioxide, Free from halogenated hydrocarbons



Aquagent® Solvent, free from pyridine, for volumetric Karl Fischer titration

- Density: 0,906 g/cm³
- Flash pt. 10°C
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H360D - H370 - H314
- GHS-P sentences: P210 - P303+P361+P353 - P305+P351+P338 - P310 - P370+P378 - P405 - P501a
- Tariff number: 3822 00 00 00

SPECIFICATIONS

water content: 100 - 200 ppm



Aquagent® Titrant 2, free from pyridine, titrant-component for volumetric Karl Fischer titration

- Flash pt. 11 °C
- LD 50 (oral, rat): 5628 mg/kg (methanol)
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H370
- GHS-P sentences: P210 - P241 - P303+P361+P353 - P370+P378 - P405 - P501a
- Tariff number: 3822 00 00 00
- Applications: analytical chemistry, laboratory reagent.

SPECIFICATIONS

For use with: Aquagent® Solvent (AQ0002)

Contains methanol



Aquagent® Titrant 5, free from pyridine, titrant-component for volumetric Karl Fischer titration

- Density: ~ 0,86 g/cm³
- Solub. in water: (20 °C): miscible
- Flash pt. 11 °C
- LD 50 (oral, rat): 5628 mg/kg (methanol)
- ADR: 3 FT1 II UN 1992
- IMDG: 3 II UN 1992
- IATA/ICAO: 3 II UN 1992
- GHS-signal word: Danger
- GHS-H sentences: H225 - H331 - H370
- GHS-P sentences: P210 - P241 - P303+P361+P353 - P370+P378 - P405 - P501a
- Tariff number: 3822 90 00 00
- Applications: analytical chemistry, laboratory reagent.

SPECIFICATIONS

For use with: Aquagent® Solvent (AQ0002)

Contains methanol



Aquagent®, D(+)-Lactose monohydrate, 5% secondary standard for KF-Oven 150 °C

- $C_{12}H_{22}O_{11} \cdot H_2O$
- $M = 360,32 \text{ g/mol}$
- CAS [10039-26-6]
- EINECS-No.: 200-559-2
- Solub. in water: (20 °C): freely soluble
- Melting point: 202 °C
- Tariff number: 1702 11 00 00
- Applications: analytical chemistry, synthesis of organic products, in food industry, for pharmaceutical use, in biochemistry, nutrient media for bacterial culture, in pharma industry.

SPECIFICATIONS

water : 4,9 - 5,2%



Aquagent®, di-Sodium tartrate dihydrate, for volumetric Karl-Fischer titration

- $C_4H_4Na_2O_6 \cdot 2H_2O$
- $M = 230,08 \text{ g/mol}$
- CAS [6106-24-7]
- EINECS-No.: 212-773-3
- Solub. in water: (20 °C): 290 g/l
- Melting point: 154°C
- Tariff number: 2918 13 00 90
- Applications: analytical chemistry, laboratory reagent.

SPECIFICATIONS

water : 15,61 - 15,71 %



Aquagent®, di-Sodium tartrate dihydrate, secondary standard for volumetric Karl-Fischer titration

- Synonyms: Tartaric acid sodium salt dihydrate
- $C_4H_4Na_2O_6 \cdot 2H_2O$
- $M = 230,08 \text{ g/mol}$
- CAS [6106-24-7]
- EINECS-No.: 212-773-3
- Solub. in water: (20 °C): 290 g/l
- Melting point: 154 °C
- LD 50 (oral, rat): 1290 mg/kg
- Tariff number: 2918 13 00 90
- Applications: analytical chemistry, for water determination.

SPECIFICATIONS

water : 15,61 - 15,71 %



Aquagent®, Standard solution 0,01%. Suitable for coulometric Karl Fischer equipment.

- C₈H₁₀
- M = 106,17 g/mol
- Density: 0,86 g/cm³
- Solub. in water: (20 °C): 0,2 g/l
- Melting point: > -34 °C
- Boiling point: 137 - 143 °C
- Flash pt. 25 °C
- Ignition temp.: ~ 465 °C
- Vapour pressure: (20 °C) 10 hPa
- Dielectric const.: (25 °C) 2,4
- ADR: 3 F1 III UN 1307
- IMDG: 3 III UN 1307
- IATA/ICAO: 3 III UN 1307
- GHS-signal word: Danger
- GHS-H sentences: H226 - H312 - H332 - H315
- GHS-P sentences: P210 - P301+P310 - P303+P361+P353 - P305+P351+P338 - P370+P378
- P405 - P501a
- Tariff number: 3822 00 00 00

SPECIFICATIONS

Water standard for coulometric KF titration.

water content: 0,1 mg/g

water content: 0,01 %

contains 0,1 mg H₂O/1 g standard

Air humidity will change the water content Protect from moisture



Aquagent®, standard solution 0,1%

- Density: (20 °C) 1,00 g/cm³
- Flash pt. 43 °C
- ADR: 3 F1 III UN 2222
- IMDG: 3 III UN 2222
- IATA/ICAO: 3 III UN 2222
- GHS-signal word: Warning
- GHS-H sentences: H226
- GHS-P sentences: P210 - P241 - P303+P361+P353 - P370+P378 - P403+P235 - P501a
- Tariff number: 2909 30 90 90

SPECIFICATIONS

Water standard for coulometric KF titration.

water content: 1,0 mg/g

water content: 0,1 %

contains 1,0 mg H₂O/1 g standard

Air humidity will change the water content Protect from moisture



Aquagent®, standard solution 0,5%

- Density: 0,85 g/cm³
- Flash pt. 21 °C
- ADR: 3 F1 II UN 1993
- IMDG: 3 II UN 1993
- IATA/ICAO: 3 II UN 1993
- GHS-signal word: Danger
- GHS-H sentences: H225 - H318 - H332 - H335 - H336 - H315
- GHS-P sentences: P210 - P301+P310 - P303+P361+P353 - P305+P351+P338 - P370+P378
- P405 - P501a
- Tariff number: 3822 00 00 00
- Applications: analytical chemistry, standard (for water determination).

SPECIFICATIONS

Water standard for coulometric KF titration.

water content: 5,00 ± 0,02 mg/ml
water content: 0,5 % (5,88 ± 0,02 mg/g)
contains 5,00 mg H₂O/ml

Air humidity will change the water content Protect from moisture



Aquagent®, standard solution 1%

- Density: 1,00 g/cm³
- Flash pt. 30 °C
- ADR: 3 F1 III UN 1993
- IMDG: 3 III UN 1993
- IATA/ICAO: 3 III UN 1993
- GHS-signal word: Danger
- GHS-H sentences: H318 - H226 - H335 - H336 - H315
- GHS-P sentences: P210 - P301+P310 - P303+P361+P353 - P305+P351+P338 - P370+P378
- P405 - P501a
- Tariff number: 3822 00 00 00

SPECIFICATIONS

Water standard for coulometric KF titration.

water content: 10,0 mg/g
water content: 1 %
contains 10,0 mg H₂O/1 g standard

Air humidity will change the water content Protect from moisture



Karl Fischer reagent 5, one-component reagent

По вопросам продаж и поддержки обращайтесь:

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