

Panreac

 **AquaMetric**

**Pyridine-free  
Karl Fischer reagents**

For volumetric and coulometric  
water determination



AQUAMETRIC is the range of pyridine-free Karl Fischer reagents from Panreac for volumetric and coulometric determination of water. AQUAMETRIC is a complete solution for all laboratories that carry out water content of a sample as it also includes water standards, working mediums and dry solvents for some specific applications referring to sample solubilization.

The use of AQUAMETRIC provides:

- more safety due to pyridine-free reagents
- more productivity obtaining fast, clear and reproducible endpoints
- more accuracy
- larger factor stability

All range of AQUAMETRIC reagents are manufactured by Panreac quality assurance ISO9001:2000

AQUAMETRIC includes:

#### Reagents for volumetric titrations:

- 1 component reagents for general use
- 1 component reagent specific for aldehydes and ketones analysis
- 2 components reagents formed by the titrant agent and the working medium
- Working mediums for specific applications including buffers to control pH in acids

#### Reagents for coulometric titrations:

- Anolyte
- Catholyte



## Volumetric titrations

### One component reagents

In one component reagents all the necessary reagents are present (iodine, sulphur dioxide and imidazole) and dissolved in diethyleneglycol mono-ethyl ether. They are the most common reagents used for the volumetric determination of water. AQUAMETRIC Composite 2 for low and medium water content samples. AQUAMETRIC Composite 5 for high water content samples, being the most used. The working medium used with this reagents is dry methanol. Fill the burette with AQUAMETRIC Composite 2 or 5 and dissolve the sample into the titration vessel with dry methanol. The endpoint is determined by titration according to the usual method. The advantage to use one component reagents is that they give more flexibility in the use of the appropriate solvent to dissolve the sample, having the necessary reagent in only one solution.

### General use

#### AQUAMETRIC Composite 2 RV

For Karl Fischer titrations.

One component reagent. 1 ml corresponds to ~ 2 mg H<sub>2</sub>O

285813.1610	500 ml	
285813.1611	1000 ml	
285813.1612	2,5 l	

#### AQUAMETRIC Composite 5 RV

For Karl Fischer titrations.

One component reagent. 1 ml corresponds to ~ 5 mg H<sub>2</sub>O

285812.1610	500 ml	
285812.1611	1000 ml	
285812.1612	2,5 l	

### For water determination in ketones and aldehydes

#### AQUAMETRIC Composite 5K RV

For Karl Fischer titrations in ketones and aldehydes.

One component reagent 1 ml corresponds to ~ 5 mg H<sub>2</sub>O

285814.1610	500 ml	
285814.1611	1000 ml	

When the samples are ketones and aldehydes and in order to avoid interferences, you should use as working medium:

#### Working medium for water determination in ketones and aldehydes AQUAMETRIC Working Medium RV

For Karl Fischer titrations in ketones and aldehydes. Use with AQUAMETRIC Composite 5K

285821.1610	500 ml	
285821.1611	1000 ml	

AQUAMETRIC Composite 2 RV 285813  
AQUAMETRIC Composite 5 RV 285812



AQUAMETRIC Composite 5K RV 285814



## Two component reagents

The Titrant solution contains iodine dissolved in methanol and the rest of necessary compounds (imidazole and sulphur dioxide in methanol) are in the working medium AQUAMETRIC Solvent, normally used with AQUAMETRIC Titrant.

In the two component reagents, the ingredients are separate what gives more stability and better conservation. The advantages are the reduction of the reaction times and more accuracy in the results being possible to calculate the factor less frequently.

It is possible to use AQUAMETRIC Solvent CM as working medium for the determination of water in non polar substances (oils and fats) containing chloroform to improve the solubility process of any fat or AQUAMETRIC Solvent Oil without any chlorinated compounds.

### As titrant agent

#### AQUAMETRIC Titrant 2 RV

For Karl Fischer titrations  
1 ml corresponds to min. 2,0 mg H<sub>2</sub>O  
Use with AQUAMETRIC Solvent

285816.1610	500 ml	
285816.1611	1000 ml	
285816.1612	2,5 l	

#### AQUAMETRIC Titrant 5 RV

For Karl Fischer titrations  
1 ml corresponds to min. 5,0 mg H<sub>2</sub>O  
Use with AQUAMETRIC Solvent

285815.1610	500 ml	
285815.1611	1000 ml	
285815.1612	2,5 l	

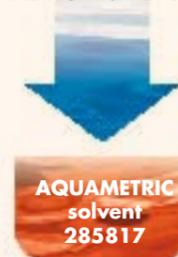
### As a general working medium with AQUAMETRIC Titrant 2/5

#### AQUAMETRIC Solvent RV

For Karl Fischer titrations  
Use with AQUAMETRIC Titrant

285817.1611	1000 ml	
285817.1612	2,5 l	

AQUAMETRIC Titrant 5 RV 285815  
AQUAMETRIC Titrant 2 RV 285816



## Working mediums for specific applications

When a working medium with buffer capacity is required, for example for the water determination in acidic solutions, we recommend to use:

#### AQUAMETRIC Buffer RV

Working medium for Karl Fischer titrations  
Buffer capacity 5 mmol acid/ml

285820.1610	500 ml	
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(contains methanol, imidazole and sulphur dioxide)

## Coulometric titrations

The iodine required for the reaction with the water in the sample is generated in situ (in the titration beaker) using a reagent solution containing iodide. The coulometric method is used with water content in the sample of less than 0.1% or absolute quantities of water in the titration beaker of less than 1 mg. The reagent does not need to be standardised, as coulometry is an absolute method.

For standard coulometric determination (units with a diaphragm), two reagent solutions, an anolyte and a catholyte, are required. The anolyte is inserted into the anode space of the cell and the catholyte into the cathode space.

### Reagents for coulometry with diaphragm

#### AQUAMETRIC Coulomat A RV

Anolyte for the coulometric determination of water.  
Use with AQUAMETRIC Coulomat C

286181.1610	500 ml	
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#### AQUAMETRIC Coulomat C RV

Catholyte for the coulometric determination of water. Use with AQUAMETRIC Coulomat A

286182.1606	25 ml	
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## Ordering information

Description FOR VOLUMETRY	Code	Package	Unit/box
<b>One-component reagents</b>			
AQUAMETRIC Composite 2 RV	285813.1610	500 ml	 6
	285813.1611	1000 ml	 6
	285813.1612	2,5 l	 4
AQUAMETRIC Composite 5 RV	285812.1610	500 ml	 6
	285812.1611	1000 ml	 6
	285812.1612	2,5 l	 4
AQUAMETRIC Composite 5K RV	285814.1610	500 ml	 6
	285814.1611	1000 ml	 6
AQUAMETRIC Working Medium RV	285821.1610	500 ml	 6
	285821.1611	1000 ml	 6
<b>Two-component reagents</b>			
AQUAMETRIC Titrant 2 RV	285816.1610	500 ml	 6
	285816.1611	1000 ml	 6
	285816.1612	2,5 l	 4
AQUAMETRIC Titrant 5 RV	285815.1610	500 ml	 6
	285815.1611	1000 ml	 6
	285815.1612	2,5 l	 4
AQUAMETRIC Solvent RV	285817.1611	1000 ml	 6
	285817.1612	2,5 l	 4
<b>Working mediums for specific applications</b>			
AQUAMETRIC Solvent CM RV	285819.1611	1000 ml	 6
	285819.1612	2,5 l	 4
AQUAMETRIC Solvent Oil RV	285818.1611	1000 ml	 6
AQUAMETRIC Buffer RV	285820.1610	500 ml	 6
AQUAMETRIC Solvent Oil B RV	286154.1611	1000 ml	 6
<b>FOR COULOMETRY</b>			
AQUAMETRIC Coulomat A RV	286181.1610	500 ml	 6
AQUAMETRIC Coulomat C RV	286182.1606	25 ml	 6

The AQUAMETRIC range is completed with:

## Moisture standards

Moisture standards to calculate the factor from AQUAMETRIC Karl Fischer reagents. Reference substances traceable against SRM of NIST. Certificate of analysis included on each sale unit.

The ampoules have a large conservation without water absorption and they are for one calibration.

### Karl Fischer Water Standard 1,00 mg/g RS

For coulometric titration  
1 g contains 1,00±0,005 mg H<sub>2</sub>O

395459.2527	10x10 ml	
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### Karl Fischer Water Standard 10,0 mg/g RS

For volumetric titration  
1 g contains 10,0±0,1 mg H<sub>2</sub>O

395458.2527	10x10 ml	
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### Sodium Tartrate 2-hydrate EQP-ACS

Primary Chemical Matter

241719.1521	10 x 1,5 g	
241719.1608	100 g	

## Dry solvents

Some of the samples are difficult to dissolve in methanol and it is necessary to use different solvents. The wide range of Panreac dry solvents with a very low water content allows the use of specific solvents to dissolve samples with low solubility on common solvents used for Karl Fischer volumetric water determination.

The dry solvents with DS quality guarantee a very low water content and low blank values during the titration.

### Dry solvents

	Code	Package	
Acetone dry (max. 0,01% water) DS	481007.1611	1000 ml	
Acetonitrile dry (max. 0,005% water) DS-ACS	481881.1611	1000 ml	
Benzene dry (max. 0,005% water) DS-ACS-ISO	481192.1611	1000 ml	
Butanone dry (max. 0,02% water) (Methylethylketone) DS-ACS	481429.1611	1000 ml	
Carbon Disulphide dry (max. 0,005% water) low in aromatic compounds DS-ACS	481244.1611	1000 ml	
Chlorobenzene dry (max. 0,01% water) DS-ACS	481953.1611	1000 ml	
Cyclohexane dry (max. 0,005% water) DS-ACS-ISO	481250.1611	1000 ml	
1,2-Dichloroethane dry (max. 0,005% water) DS-ACS	481286.1611	1000 ml	
Dichloromethane dry (max. 0,005% water) stabilized with amylene DS-ACS-ISO	481254.1611	1000 ml	
Dichloromethane dry (max. 0,005% water) stabilized with ~0,2% of ethanol DS-ACS-ISO	483675.1611	1000 ml	
Diethyl Ether dry (max. 0,0075% water) stabilized with ~6 ppm of BHT DS-ACS-ISO	482770.0311	1000 ml	
N,N-Dimethylformamide dry (max. 0,01% water) DS-ACS-ISO	481785.1611	1000 ml	
Dimethyl Sulphoxide dry (max. 0,03% water) DS-ACS	481954.1611	1000 ml	
1,4-Dioxan dry (max. 0,005% water) stabilized with ~25 ppm of BHT DS-ACS-ISO	481296.1611	1000 ml	

	Code	Package	
Ethanol absolute dry (max. 0,02% water) DS	481086.1611	1000 ml	
Ethyl Acetate dry (max. 0,005% water) DS-ACS-ISO	481318.1611	1000 ml	
n-Heptane dry (max. 0,005% water) DS	482062.1611	1000 ml	
n-Hexane 95% dry (max. 0,005% water) DS-ACS	483242.1611	1000 ml	
Isooctane dry (max. 0,005% water) DS-ACS	482064.1611	1000 ml	
Methanol dry (max. 0,005% water) DS-ACS-ISO	481091.1611	1000 ml	
Methylcyclohexane dry (max. 0,005% water) DS	482802.1611	1000 ml	
n-Pentane 95% dry (max. 0,005% water) DS	484462.1611	1000 ml	
Petroleum Ether 40-60°C dry (max. 0,005% water) DS-ACS-ISO	481315.1611	1000 ml	
2-Propanol dry (max. 0,01% water) DS-ACS-ISO	481090.1611	1000 ml	
Pyridine dry (max. 0,01% water) DS-ACS	481457.1611	1000 ml	
Tetrahydrofuran dry (max. 0,0075% water) stabilized with ~300 ppm of BHT DS-ACS	483537.1611	1000 ml	
Toluene dry (max. 0,005% water) DS-ACS-ISO	481745.1611	1000 ml	
Trichloromethane dry (max. 0,005% water) stabilized with ~50 ppm of amylene DS-ACS	483101.1611	1000 ml	
Xylene, mixture of isomers dry (max. 0,005% water) DS-ISO	481769.1611	1000 ml	

### General solvent

As common solvent to work with one component reagents we recommend the use of:

### Methanol according to Karl Fischer RE

for aquametry

171091.1611	1000 ml	
171091.1612	2,5 l	
171091.0616	25 l	

### Special solvent

To dissolve sugars and other compounds with low solubility in methanol or other solvents, we recommend the use of:

### Formamide AQUAMETRIC KF dry RV

for volumetric Karl Fischer titrations

281956.1611	1000 ml	
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#### Package symbols:

-  Glass bottle
-  Aluminium bottle
-  Glass tube with stopper and screw top
-  Glass or plastic ampoule
-  Steel-plated drum



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# AquaMetric

**Improved formulation**  
**Better factor stability**  
**Clear and stable endpoint**  
**Faster titrations**  
**Pyridine odour free**

