

VWR[®] CHEMICALS

Ready to use solutions,
reagents and standards
for volumetric and
coulometric analyses

Fast, stable and
accurate endpoints

Buffered systems for
controlled pH

Long-term stability
and shelf life

Every batch verified

REAGENTS FOR WATER DETERMINATION BY THE KARL FISCHER METHOD

For analytical chemists who need
accurate water content – every time

Volumetric range for high water content analysis

Single component reagents, two component reagents and reagents especially designed for aldehydes and ketones.

- **Reliable:** Fast and stable endpoints for accurate results time and time again
- **Safe:** Low toxicity and pyridine-free
- **Consistent:** Comparable to other leading brands



Volumetric one-component titrating reagents

Supplied in 1 l packs.

Description	Cat. No.
CombiNORM 1 for volumetric one-component KF titration (methanol-free) water equivalent 1 ml = 1 mg used with methanol (Cat. No. 85457.290)	85450.290
CombiNORM 2 for volumetric one-component KF titration (methanol-free) water equivalent 1 ml = 2 mg used with methanol (Cat. No. 85457.290)	85451.290
CombiNORM 5 for volumetric one-component KF titration (methanol-free) water equivalent 1 ml = 5 mg used with methanol (Cat. No. 85457.290)	85452.290
Combi solvent E for volumetric one-component KF titration (ethanol-based working medium)	85454.290
Lipo solvent CM non polar for non polar substances, fats and oils (working medium)	85455.290
Lipo solvent HM non polar reagent for volumetric one-component KF titration in non polar substances, fats and oils (working medium)	85456.290
Methanol quick for accelerating volumetric one-component KF titration (working medium) used with CombiNORM	85457.290
Keto solvent for volumetric one-component KF titration in aldehydes and ketones (working medium)	85459.290
CombiNORM 5K reagent for volumetric one-component Karl Fischer titration in aldehydes and ketones (methanol-free) 1 ml = 5 mg used with Solvent K (Cat. No. 85464.290)	85463.290
K reagent for volumetric one-component KF titration in aldehydes and ketones (working medium) used with CombiNORM 5K (Cat. No. 85463.290)	85464.290

Volumetric two-component titrating reagents

Supplied in 1 l packs.

Description	Cat. No.
Solvent for volumetric two-component KF titration (working medium) used with all TitrANTS	85453.290
Solvent (crude) for volumetric one- and two-component KF titration in oils (working medium)	85458.290
Solvent E reagent for volumetric two-component KF titration (ethanol-based working medium)	85460.290
Solvent CM reagent for volumetric two-component KF titration in oils (working medium)	85461.290
Solvent OIL reagent for volumetric two-component KF titration in oils (working medium)	85462.290
TitrANT 1 for volumetric two-component KF titration water equivalent 1 ml = 1 mg used with Solvent (Cat. No. 85453.290)	85465.290
TitrANT 2 for volumetric two-component KF titration water equivalent 1 ml = 2 mg used with Solvent (Cat. No. 85453.290)	85466.290
TitrANT 2E for volumetric two-component KF titration (ethanol-based) water equivalent 1 ml = 2 mg used with Solvent E (Cat. No. 85460.290)	85467.290
TitrANT 5 for volumetric two-component KF titration water equivalent 1 ml = 5 mg used with Solvent (Cat. No. 85453.290)	85468.290
TitrANT 5E for volumetric two-component KF titration (ethanol-based) water equivalent 1 ml = 5 mg used with Solvent E (Cat. No. 85460.290)	85469.290

Coulometric range for low water content at ppm level

Both anolyte and catholyte solutions have been re-formulated to offer better performance. This improved formulation increases both the speed and accuracy of titration when determining water content at the microgram level.

- **Fast:** Reach the endpoint quickly and consistently
- **Convenient:** Long product shelf life
- **Reliable:** Very stable endpoint



Coulometry reagent	Pl (ml)	Cat. No.
Anolyte solutions		
AG for cells with and without diaphragm	1000	85470.290
A preferred for cells with diaphragm	500	85472.260
E (ethanol-based) for cells with and without diaphragm	500	85473.260
AD for cells without diaphragm	500	85474.260
AG-H for applications with long-chained hydrocarbons, for cells with and without diaphragm	500	85475.260
A OVEN for use with oven, for cells with and without diaphragm	500	85476.260
OIL for applications with oils, preferred for cells with diaphragm	500	85477.260
K for applications with ketones, preferred for cells with diaphragm	500	85478.260
Catholyte solutions		
CG	50	85471.130
CG-K for applications with ketones	50	85479.130

Water standards

Our water standard range is split into 2 parts.

Standards for coulometric Karl Fischer titrations for water in liquid petroleum

- Packed in sets of 10x 2 ml, 10x 5 ml, or 5x 20 ml
- Conform to ASTM D1744, E1064, D4377



Water standard	Pk	Cat. No.
Coulometric standards		
0,1% - 1 g contains 1,0 mg H ₂ O		85486.004
1% - 1 g contains 10,0 mg H ₂ O	10x 4 g ampoules	85487.004
Volumetric standards		
0,5% - 1 ml methanol contains 5,0 mg H ₂ O	250 ml	85488.230
1% - 1 ml methanol contains 10,0 mg H ₂ O	500 ml	85489.260

Standards for coulometric and volumetric Karl Fischer titrations

Karl Fischer water standard in liquid petroleum	Pk	Cat. No.
60 µg/g	10x 5 ml	85482.005
	10x 2 ml	85483.002
100 µg/g	10x 5 ml	85483.005
	5x 20 ml	85483.020
	10x 2 ml	85484.002
1000 µg/g	10x 5 ml	85484.005
	5x 20 ml	85484.020
	10x 2 ml	85485.002
5000 µg/g	10x 5 ml	85485.005
	5x 20 ml	85485.020

Troubleshooting

Working medium variations: Influence of C-Solvent

The Karl Fischer titration can be applied to a wide variety of substances, but differences in sample properties and solubility can influence the Karl Fischer reaction. However, there are number of ways to adjust the working medium to improve solubility of the sample enabling direct Karl Fischer titration.

Here are some ideas...

- Pyridine is a good polar solvent, also acts as basic solvent for neutralisation of acids but is foul smelling
- Imidazol can be used for neutralisation acids for strong acidic samples
- Toluene and xylene improve solubility of oils
- Addition of formamide improves solubility of polar materials like proteins, carbohydrates and inorganic salts that are either insoluble or dissolve only slightly in methanol
- Acetonitrile is a good polar solvent
- N Methylpyrrolidone dissolves polymers and can be used up to 40% of the volumetric working medium
- Addition of long chains alcohols or chloroform can improve the solubility of fats, oils and long chain hydrocarbons



Feel the chemistry

VWR[®] Prolabo[®]
CHEMICALS

More than 1000 new products including solvents, standards, microbiology media, microscopy and life science products.



Also includes most important Amresco products.

Request your copy at vwr.com or from your local sales office

Austria

VWR International GmbH
Graumannsgasse 7
1150 Vienna
Tel.: +43 1 97 002 0
Fax: +43 1 97 002 600
Email: info@at.vwr.com

Belgium

VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: 016 385 011
Fax: 016 385 385
Email: vwrbe@be.vwr.com

Czech Republic

VWR International s. r. o.
Veetee Business Park
Pražská 442
CZ - 281 67 Stříbrná Skalice
Tel.: +420 321 570 321
Fax: +420 321 570 320
Email: info@cz.vwr.com

Denmark

VWR - Bie & Berntsen
Transformervej 8
2860 Søborg
Tel.: 43 86 87 88
Fax: 43 86 87 90
Email: info@dk.vwr.com

Finland

VWR International Oy
Valimotie 9
00380 Helsinki
Tel.: 09 80 45 51
Fax: 09 80 45 52 00
Email: info@fi.vwr.com

France

VWR International S.A.S.
Le Périgares – Bâtiment B
201, rue Carnot
94126 Fontenay-sous-Bois cedex
Tel.: 0 825 02 30 30 (0,18 € TTC/min)
Fax: 0 825 02 30 35 (0,18 € TTC/min)
Email: info@fr.vwr.com

Germany

VWR International GmbH
Hilpertstraße 20a
D - 64295 Darmstadt
Freecall: 0800 702 00 07
Fax: 0180 570 22 22*
Email: info@de.vwr.com
*0,14 €/Min. aus d. dt. Festnetz

Hungary

VWR International Kft.
Simon László u. 4.
4034 Debrecen
Tel.: (52) 521-130
Fax: (52) 470-069
Email: info@hu.vwr.com

Ireland / Northern Ireland

VWR International Ltd /
VWR International (Northern Ireland) Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: 01 88 22 222
Fax: 01 88 22 333
Email: sales@ie.vwr.com

Italy

VWR International PBI S.r.l.
Via San Giusto 85
20153 Milano (MI)
Tel.: 02-3320311/02-487791
Fax: 800 152999/02-40090010
Email: info@it.vwr.com

The Netherlands

VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: 020 4808 400
Fax: 020 4808 480
Email: info@nl.vwr.com

Norway

VWR International AS
Haavard Martinsens vei 30
0978 Oslo
Tel.: 02290
Fax: 815 00 940
Email: info@no.vwr.com

Poland

VWR International Sp. z o.o.
Limbowa 5
80-175 Gdansk
Tel.: 058 32 38 200 do 204
Fax: 058 32 38 205
Email: info@pl.vwr.com

Portugal

VWR International -
Material de Laboratório, Lda
Edifício Neopark
Av. Tomás Ribeiro, 43- 3 D
2790-221 Carnaxide
Tel.: 21 3600 770
Fax: 21 3600 798/9
Email: info@pt.vwr.com

Spain

VWR International Eurolab S.L.
C/ Tecnología 5-17
A-7 Llinars Park
08450 - Llinars del Vallès
Barcelona
Tel.: 902 222 897
Fax: 902 430 657
Email: info@es.vwr.com

Sweden

VWR International AB
Fagerstagatan 18a
163 94 Stockholm
Tel.: 08 621 34 00
Fax: 08 621 34 66
Email: kundservice@se.vwr.com

Switzerland

VWR International GmbH
Lerzenstrasse 16/18
8953 Dietikon
Tel.: 044 745 13 13
Fax: 044 745 13 10
Email: info@ch.vwr.com

Turkey

VWR International Laboratuvar
Teknolojileri Ltd.Şti.
Orta Mah. Cemal Gürsel Caddesi
Ördekcioglu İşmerkezi No.32/1
34896 Pendik - Istanbul
Tel.: +90216 598 2900
Fax: +90216 598 2907
Email: info@pro-lab.com.tr

UK

VWR International Ltd
Customer Service Centre
Hunter Boulevard - Magna Park
Lutterworth
Leicestershire
LE17 4XN
Tel.: 0800 22 33 44
Fax: 01455 55 85 86
Email: uksales@uk.vwr.com

Australia

VWR International, Pty Ltd.
Level 1, Unit 1a/60 Enterprise Place
Tingalpa, Queensland, 4173
Tel.: 1300 727 696
Fax: 1300 135 123

China

VWR International China Co., Ltd.
Shanghai Branch
Room 256, No. 3058 Pusan Road
Pudong New District
Shanghai 200123
Tel.: +86-21-5898 6888
Fax: +86-21-5855 8801
Email: info_china@vwr.com

India

VWR Lab Products Private Limited
No.139. BDA Industrial Suburb,
6th Main, Tumkur Road, Peenya Post,
Bangalore, India – 560058
Tel.: +91-80-28078400
Fax: +91-80-28078410
Email: vwr_india@vwr.com

New Zealand

Global Science - A VWR Company
241 Bush Road
Albany 0632, Auckland
Tel.: 0800 734 100
Fax: 0800 999 002
Email: sales@globalscience.co.nz

Singapore

VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel: +65 6505 0760
Fax: +65 6264 3780
Email: sales@sg.vwr.com

GO TO VWR.COM FOR
THE LATEST NEWS,
SPECIAL OFFERS AND
DETAILS OF YOUR LOCAL
VWR DISTRIBUTOR