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HYDRANAL™ Technical Information Sheet T013 Rev. 1

How to use Hydranal NEXTGEN Coulomat A-FA + C-FA reagents

Appearance of the reagent

1) Color
Alcohol containing KF reagents are generally colorless or yellow. In contrast to this alcohol-free Coulomat A-FA and C-FA have a yellow-orange to deep orange color.

Coulomat AG Coulomat AK Coulomat A-FA

2) Excess of iodine
Depending on the storage conditions, a reaction can be triggered, generating iodine production inside the original bottle. This can generate an excess of iodine in the reagent and cause the solution to become brown. If the titration cell is filled with such a darkened reagent, the titrator indicates an end point parameter and is not able to start the conditioning mode. This can result in an error message indicating “over-titration”.

If the A-FA reagent is brown (as opposed to the orange sample pictured above) an excess of iodine is present in the reagent. Excess of iodine does not have a negative impact on the product quality or render the reagent unusable. The excess iodine simply needs to be reduced before the reagent can be used properly. Please use one of the following procedures, either A or B:

A. Removing iodine excess in the bottle:
Add drop sized increments of water (5 mg drops) directly into the original 500 mL Coulomat A-FA bottle until reagent appears dark orange as shown in the “perfect” picture below. *The sum of added water should not exceed 20 mg H_2O per of 500 mL Coulomat A-FA.*
Always avoid an excess of water inside the reagent. High water amounts will have a negative impact on the conditioning time and shelf life of the reagent.

Please DO NOT use carbonates like propylene carbonate for iodine reduction in the bottle. In the long term, carbonates may decompose and destroy the alcohol-free reagent.

B. Removing iodine excess in the titration vessel:
Fill the titration cell according to chapter “Filling the titration cell” below. If the titrator indicates “over-titration”, add a water:acetonitrile-mixture (1:20) directly into the anolyte, till “over-titration” is overcome*. Please never add pure water into the titration cell!*

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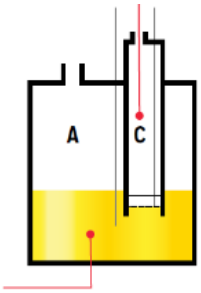
water excess perfect iodine excess

3) Keep the reagent away from sunlight or artificial sunlight lamps.
When reagent is used in a colorless titration cell, auto iodine production may take place. The titrator may over titrate and/or drift values may drop to zero.
If sunlight cannot be avoided, cover the titration cell with aluminum foil.
Alternatively, brown-glass titration vessels are available from many equipment suppliers.

4) Store the reagent in dry conditions below 30°C.

Filling the titration cell

Hydranal Coulomat C-FA



Hydranal Coulomat A-FA

a. Use a clear and dry titration vessel and generator electrode.
b. Gently clean the indication electrode with a soft paper tissue.
c. Snap off top tag of the Coulomat C-FA ampoule at the predetermined breaking zone.
d. Fill the entire content into the cathodic chamber.
e. Fill the anode compartment with the anolyte Coulomat A-FA. The anolyte level should initially be a few millimeters higher than the catholyte level.
f. Start the conditioning mode

Use a cell with a diaphragm. A cell without a diaphragm provides results that may be increased by up to 10%. Also unwanted side reactions at the cathode cannot be excluded if a cell without a diaphragm is used.

When should the anolyte and the catholyte be replaced?

a) At least once a week.
b) If recovery of Hydranal Water Standard 0.1 PC is higher than +/- 10%.
c) As soon as sample-related deposits are formed inside anode or cathode compartment. Solid deposits can damage the generator electrodes.
d) If the drift increases continuously above 20 µg/min.

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Which water standards can be used?

For verification of the titration cell, alcohol-free water standards are recommended:

Art. No.	Water Standard	Description	Matrix	Comment
34446	HYDRANAL-Water Standard 0.1 PC	Liquid standard, water content 0.1 mg/g = 0.01%	Propylene Carbonate	Highly recommended
34426	HYDRANAL-CRM Water Standard 1.0	Liquid standard, water content 1.0 mg/g = 0.1%	Anisole	Do not use with borate samples

Note: Do not use water standards that contain alcohols

Even small amounts of alcohol destroy the alcohol-free system.
Strong side reactions with alcohol-sensitive samples will occur and incorrect titration results and/or high drift values will be obtained. For information on composition, please check the safety data sheet of each water standard used. Examples of non-compatible alcohols:

a) Methanol, ethanol, propanol, butanol, etc.
b) 1-methoxy-2-propanol / 1-Methoxypropan-2-ol

Further information can be found on our website:
https://lab.honeywell.com/en/hydranal/nextgen/fa-reagents

Articles and Whitepapers:

- ➔ Hydranal NEXTGEN FA for ketones Flyer
- ➔ Hydranal NEXTGEN FA for ketones Whitepaper
- ➔ Hydranal NEXTGEN FA for LiBs Flyer
- ➔ Hydranal NEXTGEN FA for LiBs Whitepaper

Technical information sheets:

- ➔ Recommended handling of water standards:
  See Hydranal-Technical Information Sheet T007

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Reagents and water standards:
34470 HYDRANAL-NEXTGEN Coulomat C-FA
34471 HYDRANAL-NEXTGEN Coulomat A-FA

34426 HYDRANAL-CRM Water Standard 1.0
34446 HYDRANAL-Water Standard 0.1 PC

Auxiliaries:
34881 Riedel-de Haën-Acetonitrile R CHROMASOLV™, ≥99.8% (GC)
34241 HYDRANAL-Molecular Sieve 0.3 nm

Hydranal Center of Excellence
Honeywell Research Chemicals
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