APPLICATION NOTE

Turbidity recognition in COD tests

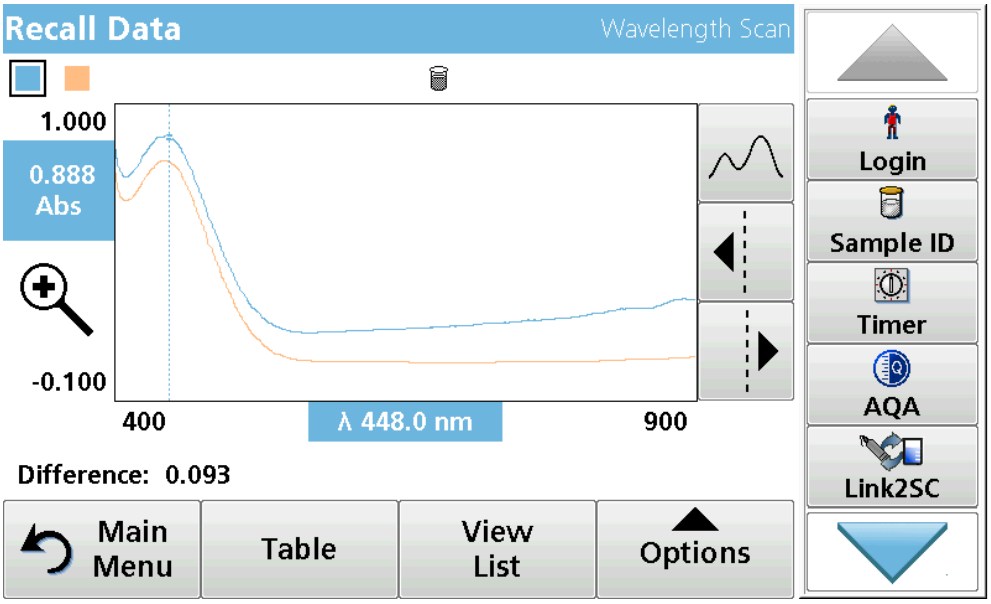
For cuvette tests LCK314 and LCK1414 used on DR3900 and DR6000

Introduction

COD and Turbidity:

In the procedure of the COD cuvettes it is an important step that the cuvettes after sample digestion are shaken again until they are hot. Due to this required mixing all particles in the cuvettes are dispersed and result in turbidity in the digested sample.
To prevent this turbidity from affecting the final COD result, the cuvettes must be allowed to settle down for 30 minutes before the cuvette is read.

To further assist customers in preventing errors in the COD measurement due to turbidity, we have integrated in the new application method COD (T) an additional measurement at 860 nm in the procedures for LCK314 and LCK1414 using DR3900 and DR6000. This reading at 860 nm detects any turbidity in the cuvette that would affect also the result of the COD measurement.
In the example below the turbidity (blue line) results in an 0.093 Abs. increase in the absorbance at 448 nm and so finally in a wrong result.



Screen 1: Wavelength Scan of LCK314 cuvette with identical COD content (orange without turbidity; blue with turbidity).

Before Starting

When using the Application on DR3900 or DR6000 for the first time:
Download the additional evaluation **Turbidity recognition at COD** as an application from the Internet:
Go to www.hach.com and search by test **LCK314** or **LCK1414** or by instruments **DR3900** or **DR6000** and **Documents and Software** the application **Turbidity recognition at COD** and save it.

Open the zipped file with a double-click and save the folder used for your photometer to an USB stick:

- DR 3900 dbhlm
- DR 6000 dbhlh

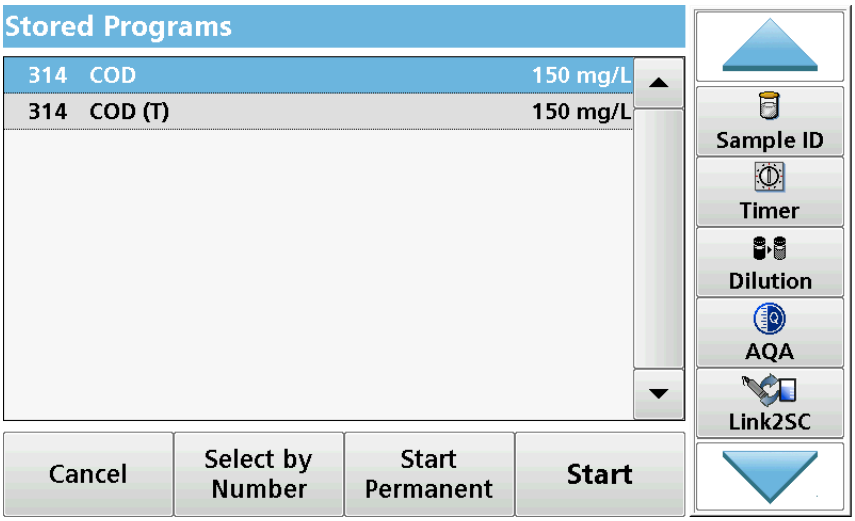
Take the USB stick and upload the application to your photometer.
In the PDF file you will find the application note with a detailed description.
For further information, please see the operating instruction for your photometer.

Procedure

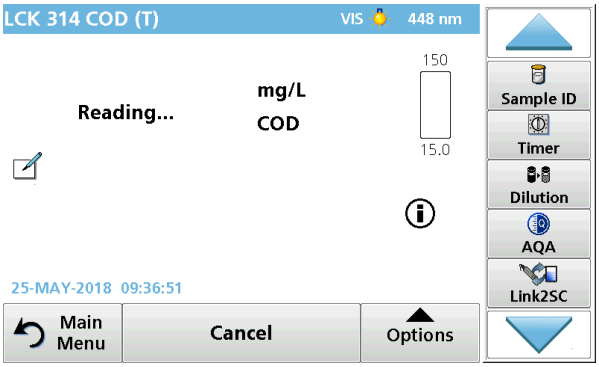
To evaluate the cuvettes, the appropriate evaluation method must be selected:

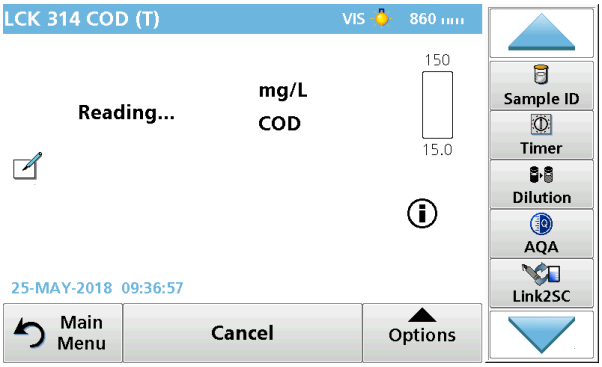
Using LCK314:

- Place the barcoded cuvette into the DR3900 / DR6000.
- The following screen will appear:



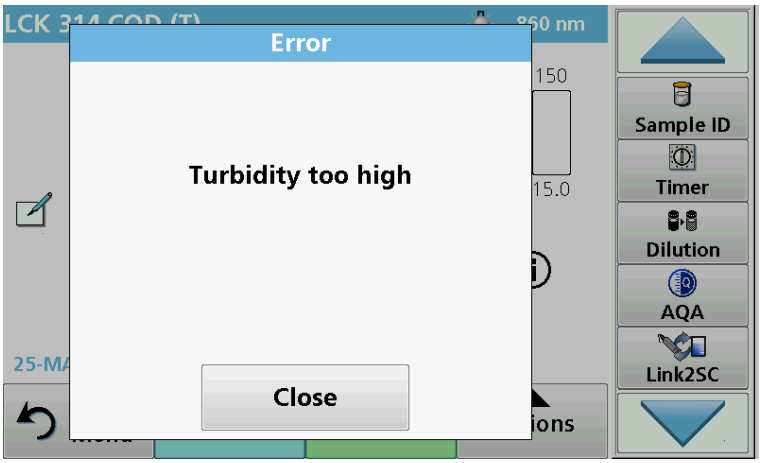
- Select the method **314 COD(T)** for the evaluation with turbidity recognition.
- Press Start or Start Permanent to start the measurement.
- The cuvette will be measured automatically at the normal used wavelength 448 nm (COD content) and additionally at 860 nm (Turbidity).





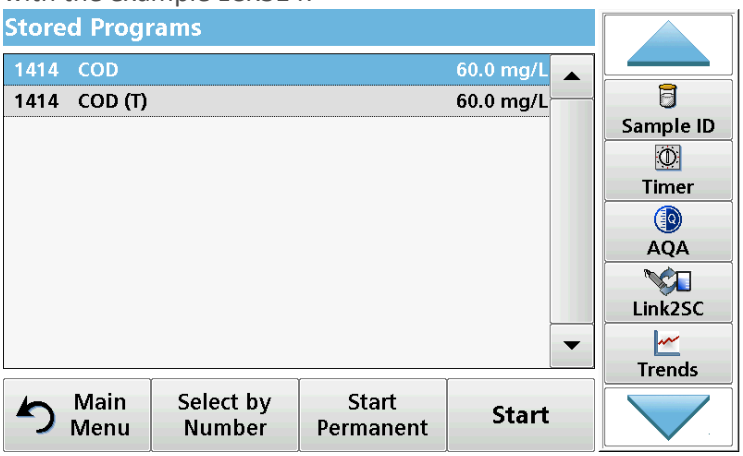
- If the cuvette is **not turbid**, the COD result will be shown (as normal):

- An error message will be shown if the turbidity in the cuvette is too high.



Using LCK1414:

Using LCK1414 works in the same manner as shown above for LCK314. The cuvette is measured at 348 nm (COD content) and 860nm (Turbidity) and the results are displayed in the same way as shown above with the example LCK314:



Measuring Range

LCK314: 15-150 mg/L COD
LCK1414: 6-60 mg/L COD

Test storage

Storage temperature: 15–25 °C (59–77 °F)
Protect against light

Equipment and Reagents Needed

Cuvette test thermostat (LT 200, HT 200 S)

Attention!

Read the Material Safety Data Sheets (MSDS) for the chemicals used. Use the recommended personal protective equipment. Dispose of reacted solutions according to local, state and federal regulations. Disposal information for unused reagents can be found in the safety data sheets. For more information on disposal, please contact your facility's environmental, health and safety staff and/or local regulatory authorities.
Expect strong heat generation, when adding the sample to the reagent contained in the cuvette.

Summary of method

Oxidizable substances react with sulphuric acid and potassium dichromate solution in the presence of silver sulphate as a catalyst. Chloride is masked by mercury sulphate. The reduction in the yellow coloration of Cr^{6+} is evaluated.

If the App Note will be or may be printed in the future, we will add printing information and bar code.

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