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# **Standard Operating Procedure**

**for:**

## **DR1010 COD and DBR200**

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Environmental Sciences**

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## **1. Purpose**

The purpose of this SOP is to regulate the operation, usage and maintenance of DR1010 COD and DBR 200.

## **2. Scope**

This SOP applies to all personnel using and managing DR1010 COD and DBR 200.

## **3. Definition/Abbreviation**

COD: Chemical oxygen demand. It refers to the amount of oxidant consumed in the treatment of water samples with potassium dichromate as the oxidant under the condition of strong acid and heating. The amount of oxidant is expressed by mg/L of oxygen. Often used as an indicator of relative content of organic compounds.

## **4. Procedure**

### **4.1 Instrument and materials**

4.1.1 DRB 200

4.1.2 DR1010

4.1.3 COD prefabricated tubes: contains the reagent ingredients (3mL) required for COD analysis (when using 0-15000mg/L refabricated tubes, only 0.2mL is added to be tested for water samples)

### **4.2 Sample preparation**

4.2.1 Open COD prefabricated tube, add water sample 2mL and screw the cap tightly.

### **4.3 Sample digestion process**

4.3.1 Push the power switch on the back of DRB200 to turn on the instrument. One beep is heard. It means the instrument is ready for use.

4.3.2 You can choose the stored program or define your own program.

4.3.3 If you choose the stored program, you can choose COD, TOC, 100°C, 105°C, 150°C, 165°C.

4.3.4 If you use your own program, use PRG1-PRG3 to setup. For example, use COD program: 150°C for 120min. Follow the steps:

- Press “Select Program” to choose “PRG1” to enter programming mode.
- Enter a name for your program (4-character) and press “OK” to save it.
- Push or hold down the up and down arrow keys to set the temperature (37°C -165°C). Press “OK” to save it.
- Push or hold down the up and down arrow keys to set the time (0-480 mins). Press “OK” to save it.
- Press “OK” to save the program. Press “Prog” to change it.
- Push up arrow to return to the “Select Program”.

4.3.5 Select a program and press “start” to running the program. Two beeps are heard and it reaches the required temperature to put the sample in the cell.

4.3.6 Put the sample in the cell, disclose the cap. Press right button to start digestion process. When 120 mins counts down and temperature drops to 120 °C, 4 beeps are heard. Take the tubes and bottom up and down the tubes serval times, then cool them on the holder.

4.3.7 Close the instrument.

#### **4.4 Measure COD**

4.4.1 Turn on the DR1010.

4.4.2 Choose the program you need after instrument automatically self-check.

4.4.3 Put the control sample into the cell. Then press “0”.

4.4.4 Take off control sample and put sample 1. Press “read” to get the result.

4.4.5 Take off the sample 1 and put another sample to measure.

#### **4.5 Maintenance**

4.5.1 Clean the instrument

- Close the instrument and cut off the power.
- Clean the instrument with a soft cloth that has been dampened with distilled water or dilute soap solution. Make sure no water entering into the instrument.
- Do not use flammable agents or rosin, acetone to clean the instrument and display screen.

- Don't clean the instrument when heating.

#### 4.5.2 Troubleshooting

- Refers to the following table when error occurs:

Error	Solution
Block is too hot! Please wait	The temperature of the heating block is greater than the selected temperature. Wait until the temperature of the heating block decrease.
Init error	The instrument is defective. Contact customer service.

#### 4.5.3 Notes:

- DBR 200 was used for the digestion of the samples. The existing reagents and digestion system was designed for solutions with COD of 50-150 mg/L. Solutions with COD less than 50 mg/L can't be accurately measured with this system.
- The digestion bottles should be kept in dark place before use. Carefully read the MSDS about the reagents before use.

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