OXYGEN SCAVENGERS

DEHA (Diethylhydroxylamine), Carbohydrazide, Erythorbic Acid, Hydroquinone, Mehtylethylketoxime

IRON REDUCTION METHOD • CODE 4857

QUANTITY	CONTENTS	CODE
15 mL	*DEHA Reagent #1	*4791-E
15 mL	*DEHA Reagent #2	*4792-E
15 mL	*DEHA Reagent #3	*4793-E

*WARNING: Reagents marked with an * are considered hazardous substances. To view or print a Material Safety Data Sheet (MSDS) for these reagents see MSDS CD or our web site. To obtain a printed copy, contact us by e-mail, phone or fax.

Oxygen can lead to corrosion in many parts of a boiler. Oxygen scavengers are added to the water to eliminate oxygen and thus decrease the chance of corrosion. Diethylhydroxylamine (DEHA) is a volatile oxygen scavenger used in boilers. It can also passivate steel and has a low toxicity.

APPLICATION: Boilers

RANGE: 0.000–0.700 ppm DEHA (Diethylhydroxylamine)
0.000–0.900 ppm Carbohydrazide
0.00–3.00 ppm Erythorbic Acid
0.00–2.00 ppm Hydroquinone
0.00–3.00 ppm Methylethylketoxime

METHOD: Ferric iron is reduced to ferrous iron by oxygen scavengers in proportion to the concentration in the sample. The resulting ferrous iron reacts with an indicator to produce a purple color.

SAMPLE HANDLING & PRESERVATION: Analyze samples immediately. Rinse sample containers and glassware with 1:1 hydrochloric acid to avoid iron contamination.

INTERFERENCES: Other oxygen scavengers, such as DEHA, carbohydrazide, erythorbic acid, hydroquinone and methylethylketoxime will interfere. Stray light and substances which complex iron or reduce ferric iron will also interfere.

DEHA PROCEDURE

1. Press and hold **ON** button until colorimeter turns on.
2. Press **ENTER** to start.
3. Press **ENTER** to select `TESTING MENU`.
4. Select `ALL TESTS` (or another sequence containing `38 DEHA` from `TESTING MENU`.
5. Scroll to and select `38 DEHA` from menu.
6. Rinse a tube (0290) with sample water. Fill to 10 mL with sample.
7. Insert the tube into chamber, close lid and select `SCAN BLANK`.
8. Remove the tube from colorimeter.
9. Add 3 drops of *DEHA Reagent #1 (4791). Swirl to mix.
10. Add 3 drops of *DEHA Reagent #2 (4792). Swirl to mix.
11. Add 3 drops of *DEHA Reagent #3 (4793). Invert 3 times to mix.
12. Insert the tube into chamber. Close lid.
13. Wait 15 minutes. Do not open the lid during the waiting time. The reaction is photosensitive.
14. Remove tube from chamber. Invert 2 times to mix.
15. Immediately insert tube into chamber, close lid and select `SCAN SAMPLE`. Read within 30 seconds. Record result in ppm DEHA.
16. Press **OFF** button to turn the colorimeter off or press **EXIT** button to exit to a previous menu or make another menu selection.

☑ NOTE: For best possible results, a reagent blank should be determined to account for any contribution to the test result by the reagent system. To determine the reagent blank, follow the above test procedure to scan a distilled or deionized water blank. Then follow the above procedure to perform the test on a distilled or deionized water sample. This test result is the reagent blank. Subtract the reagent blank from all subsequent test results of unknown samples. It is necessary to determine the reagent blank only when a new lot number of reagents is obtained.

CARBOHYDRAZIDE PROCEDURE

1. Press and hold **ON** button until colorimeter turns on.
2. Press **ENTER** to start.
3. Press **ENTER** to select `TESTING MENU`.
4. Select `ALL TESTS` (or another sequence containing `14 c-hydrazide` from `TESTING MENU`.
5. Scroll to and select `14 c-hydrazide` from menu.
6. Rinse a tube (0290) with sample water. Fill to 10 mL with sample.
7. Insert the tube into chamber, close lid and select `SCAN BLANK`.
8. Remove the tube from colorimeter.
9. Add 3 drops of *DEHA Reagent #1 (4791). Swirl to mix.
10. Add 3 drops of *DEHA Reagent #2 (4792). Swirl to mix.
11. Add 3 drops of *DEHA Reagent #3 (4793). Invert 3 times to mix.
12. Insert the tube into chamber. Close lid.
13. Wait 15 minutes. Do not open the lid during the waiting time. The reaction is photosensitive.
14. Remove tube from chamber. Invert 2 times to mix.
15. Immediately insert tube into chamber, close lid and select `SCAN SAMPLE`. Read within 30 seconds. Record result in ppm carbohydrazide.
16. Press **OFF** button to turn the colorimeter off or press **EXIT** button to exit to a previous menu or make another menu selection.

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ERYTHORBIC ACID PROCEDURE

1. Press and hold **ON** button until colorimeter turns on.
2. Press **ENTER** to start.
3. Press **ENTER** to select `TESTING MENU`.
4. Select `ALL TESTS` (or another sequence containing `40 E-thorbic A` from `TESTING MENU`.
5. Scroll to and select `40 E-thorbic A` from menu.
6. Rinse a tube (0290) with sample water. Fill to 10 mL with sample.
7. Insert the tube into chamber, close lid and select `SCAN BLANK`.
8. Remove the tube from colorimeter.
9. Add 3 drops of *DEHA Reagent #1 (4791). Swirl to mix.
10. Add 3 drops of *DEHA Reagent #2 (4792). Swirl to mix.
11. Add 3 drops of *DEHA Reagent #3 (4793). Invert 3 times to mix.
12. Insert the tube into chamber. Close lid.
13. Wait 15 minutes. Do not open the lid during the waiting time. The reaction is photosensitive.
14. Remove tube from chamber. Invert 2 times to mix.
15. Immediately insert tube into chamber, close lid and select `SCAN SAMPLE`. Read within 30 seconds. Record result in ppm erythorbic acid.
16. Press **OFF** button to turn the colorimeter off or press **EXIT** button to exit to a previous menu or make another menu selection.

☑ NOTE: For best possible results, a reagent blank should be determined to account for any contribution to the test result by the reagent system. To determine the reagent blank, follow the above test procedure to scan a distilled or deionized water blank. Then follow the above procedure to perform the test on a distilled or deionized water sample. This test result is the reagent blank. Subtract the reagent blank from all subsequent test results of unknown samples. It is necessary to determine the reagent blank only when a new lot number of reagents is obtained.

HYDROQUINONE PROCEDURE

1. Press and hold **ON** button until colorimeter turns on.
2. Press **ENTER** to start.
3. Press **ENTER** to select `TESTING MENU`.
4. Select `ALL TESTS` (or another sequence containing `49 H-quinone` from `TESTING MENU`.
5. Scroll to and select `49 H-quinone` from menu.
6. Rinse a tube (0290) with sample water. Fill to 10 mL with sample.
7. Insert the tube into chamber, close lid and select `SCAN BLANK`.
8. Remove the tube from colorimeter.
9. Add 3 drops of *DEHA Reagent #1 (4791). Swirl to mix.
10. Add 3 drops of *DEHA Reagent #2 (4792). Swirl to mix.
11. Add 3 drops of *DEHA Reagent #3 (4793). Invert 3 times to mix.
12. Insert the tube into chamber. Close lid.
13. Wait 15 minutes. Do not open the lid during the waiting time. The reaction is photosensitive.
14. Remove tube from chamber. Invert 2 times to mix.
15. Immediately insert tube into chamber, close lid and select `SCAN SAMPLE`. Read within 30 seconds. Record result in ppm hydroquinone.
16. Press **OFF** button to turn the colorimeter off or press **EXIT** button to exit to a previous menu or make another menu selection.

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METHYLETHYLKETOXIME PROCEDURE

1. Press and hold **ON** button until colorimeter turns on.
2. Press **ENTER** to start.
3. Press **ENTER** to select `TESTING MENU`.
4. Select `ALL TESTS` (or another sequence containing `58 m-e-ketoxim` from `TESTING MENU`.
5. Scroll to and select `58 m-e-ketoxim` from menu.
6. Rinse a tube (0290) with sample water. Fill to 10 mL with sample.
7. Insert the tube into chamber, close lid and select `SCAN BLANK`.
8. Remove the tube from colorimeter.
9. Add 3 drops of *DEHA Reagent #1 (4791). Swirl to mix.
10. Add 3 drops of *DEHA Reagent #2 (4792). Swirl to mix.
11. Add 3 drops of *DEHA Reagent #3 (4793). Invert 3 times to mix.
12. Insert the tube into chamber. Close lid.
13. Wait 15 minutes. Do not open the lid during the waiting time. The reaction is photosensitive.
14. Remove tube from chamber. Invert 2 times to mix.
15. Immediately insert tube into chamber, close lid and select `SCAN SAMPLE`. Read within 30 seconds. Record result in ppm methylethylketoxime.
16. Press **OFF** button to turn the colorimeter off or press **EXIT** button to exit to a previous menu or make another menu selection.

☑ NOTE: For best possible results, a reagent blank should be determined to account for any contribution to the test result by the reagent system. To determine the reagent blank, follow the above test procedure to scan a distilled or deionized water blank. Then follow the above procedure to perform the test on a distilled or deionized water sample. This test result is the reagent blank. Subtract the reagent blank from all subsequent test results of unknown samples. It is necessary to determine the reagent blank only when a new lot number of reagents is obtained.