Operations challenge 2024

Practice Laboratory Test

Recommended Study Material

Questions will be pulled directly from this material.

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- 2023 WEFTEC Laboratory Procedure
- Standard Methods – Method 2540 Solids
- Standard Methods – Method 2510 Conductivity

1. **What does TSS stand for when referring to the laboratory test?**
   a. Total sludge solids
   b. Total slurry solids
   c. Total semi solids
   d. Total suspended solids

2. **What is the maximum sample volume that can be filtered for the TSS test?**
   a. 750 mL
   b. 1000 mL
   c. 1500 mL
   d. 2000 mL

3. **The temperature of the TSS drying oven is 105°C. Which of the following is true?**
   a. The temperature is too low. Increase the oven temperature setting.
   b. The temperature is too high. Decrease the oven temperature setting.
   c. The temperature is acceptable. No action necessary.
   d. Call technical support to schedule service.

4. **What is the minimum acceptable temperature for the TSS drying oven in °C?**
   a. 103
   b. 102
   c. 101
   d. 100

5. **What is the maximum holding time for TSS samples?**
   a. 24 h
   b. 48 h
   c. 7 days
   d. 14 days

6. **Using a commercially purchased 1000 ppm stock solution, you must prepare a 10 ppm intermediate solution before preparing your 3 working calibration standards. How many mL of the stock solution must be added to a 100 mL volumetric flask filled to volume with deionized water in order to prepare the intermediate solution?**
   a. 0.1 mL
   b. 1.0 mL
   c. 2.0 mL
   d. 10.0 mL

7. **Using a commercially purchased 1000 ppm stock solution, you must prepare a 10 ppm intermediate solution before preparing your 3 working calibration standards. Three (3) separate 100 mL volumetric flasks will be used to prepare working standards. The standards will be brought to volume using deionized water. How many mL of intermediate solution (10ppm) must be used to prepare 0.5 ppm, 1.0 ppm, and 2.0 ppm working standards?**

	mL intermediate to prepare 0.5 ppm working standard	mL intermediate to prepare 1.0 ppm working standard	mL intermediate to prepare 2.0 ppm working standard
a	0.05	0.1	0.2
b	0.25	0.5	1.0
c	5.0	10.0	20.0
d	0.5	1.0	2.0

8. **After calibrating the conductivity meter with a 1412 µmhos/cm standard, the calibration is verified using a 707 µmhos/cm second source standard. The acceptance criteria for this standard is ±20% of its true value. If the meter read 729 µmhos/cm when inserted in a solution of the second source standard, what was the percent recovery?**
   a. 51.6%
   b. 84.4%
   c. 97.0%
   d. 103.1%

9. **A sample and sample duplicate were analyzed for conductivity. The sample result was 1718 µmhos/cm and the sample duplicate result was 1746 µmhos/cm. What was the percent difference between the two readings?**
   a. 1732 µmhos/cm
   b. 20%
   c. 1.6%
   d. 28 µmhos/cm

10. **If TSS samples take longer than _____ minutes to filter, they must be reanalyzed.**
   a. 3 minutes
   b. 5 minutes
   c. 1 minutes
   d. 10 minutes

11. **Given the following data, calculate the TSS result.**
   Weight of Filter (g) = 0.1107
   Weight of Filter + Dried Residue (g) = 0.1151
   Sample Volume (mL) = 400
   a. 0.011 mg/L
   b. 1.1 mg/L
   c. 11 mg/L
   d. 110 mg

12. **What method is used to store TDS samples prior to analysis?**
    a. Add sulfuric acid and refrigerate.
    b. No preservative, warm to 103-105 degrees Celsius
    c. Sodium Thiosulfate
    d. No preservative

13. **How many mLs of standard should be added to a 50mL volumetric flask to make a 100ppm conductivity standard from a 1000ppm primary stock?**
    a. 2.0 mL
    b. 2.5 mL
    c. 5.0 mL
    d. 10.0 mL

14. **How do you fill a volumetric flask?**
    a. Fill the top of the water line to the volumetric line
    b. Fill the top of the water line to the top of the flask
    c. Fill the bottom of the meniscus to the volumetric line
    d. Fill the bottom of the meniscus to the top of the flask

15. **Which of the following is the most accurate choice for measuring standards?**
    a. Class A Volumetric flask
    b. Erlenmeyer flask
    c. Graduated Cylinder
    d. Beaker

16. **What is a composite sample?**
    a. A mixture of two or more samples collected from multiple locations over time
    b. A mixture of two or more samples collected from one location over time
    c. A continuous sample collected at one location using online monitoring equipment
    d. A mixture of 8 or more samples from one location collected over time

17. **What is a grab sample?**
    a. A single sample, 100ml or greater collected at a specific location and moment in time
    b. A mixture of two or more samples from separate locations collected at the same time
    c. A continuous sample collected at one location using online monitoring equipment
    d. A sample collected at a specific location multiple times over a 24 hour period

18. **What is the proper method for using a pipette?**
    a. Use a pipette bulb to pull sample into the pipette
    b. Use your finger to pull sample into the pipette
    c. Use your mouth to pull sample into the pipette
    d. Skip the pipette and estimate how much sample to pour up

19. **The 1st edition was published in 1905 and included techniques suitable for the examining of many types of samples encountered in the assessment of water quality and water pollution?**
    a. Preferred Manual for Analysis
    b. Wastewater Handbook
    c. North Carolina Water Quality Manual of 1905
    d. Standard Methods for the Examination of Water and Wastewater

20. **Conductivity is the measure of the ability of an aqueous solution to carry?**
    a. A pre-determined wavelength
    b. An electrical current
    c. A specified color
    d. The total weight of the sample

21. **TSS is what portion of a sample?**
    a. Solids lost after ignition
    b. Percent total solids
    c. Solids suspended or dissolve in water
    d. Total solids retained on filter

22. **PFAS compounds are a group of man-made compounds characterized by a strong fluorine to carbon bond. These compounds have hundreds of uses from stain resistant fabric, firefighting , and non-stick applications. What does PFAS stand for:**
    a. Poly Fabric Anti Stain Material
    b. Permanent Fluoro Activated Substances
    c. Per and Poly Fluoro Alkyl Substances
    d. Premium Food Anti Stick

23. **Operators often us mg/l to express a measure of the concentration by weight of a substance per unit volume in water or wastewater. An approximate equivalent is:**
    a. PPT (Parts per Trillion)
    b. PPM (Parts per Million)
    c. Percentage (parts per hundred) %
    d. Grams in a liter

24. **An operator needs to make a dilution with a final concentration of 10 mg/l.**

    Given:
    100 ml volumetric flask
    Stock standard 1,000 mg/l
    CV=CV

    The transfer volume of the stock solution to the 100ml volumetric flask will be:
    a. 10 ml
    b. 1 ml
    c. 100 ml
    d. 10 ml

25. **An acid often used in the laboratory to adjust pH is H_2SO_4. This compound can also be prevalent in wastewater collection systems leading to corrosion. This compound is also known as:**
    a. Muriatic Acid
    b. Smelly Acid
    c. Sulfuric Acid
    d. Hydro Chloric Acid

26. Target Reference Concentration = <u>1000 µS</u>
Environmental Express Reference Pouch Concentration = 12.88mS
(Show Calculation)

ANSWERS

1. D
2. B
3. C
4. A
5. C
6. B
7. C
8. D
9. C
10. D
11. C
12. D
13. C
14. C
15. A
16. D
17. A
18. A
19. D
20. B
21. D
22. C
23. B
24. B
25. C