

Laboratory work № 2. Nitritometric analysis of novokaine.

Equipment and glassware:

- 3 Erlenmeyer flasks, volume 100 mL;
- Buret on 25,00 mL fastened on a ring stand;
- Pipet on 10,00 mL;
- Glass or plastic funnel of small diameter;
- Bottle with DW.
- Measured cylinder.

Reagents:

- Solid sodium nitrite;
- Solid sulfanilic acid;
- Solution of 2 M HCl,
- Solution potassium bromide,
- a solution of tropeolin 00 and a solution methylene blue.
- Streptocide
- novocaine

Part 1. Preparation and standardization of a solution of 0,1 mol/l sodium nitrite.

Procedure:

1. Count the weight of sodium nitrite, necessary for preparation of 0,1 mol/l nitrite sodium, 150 ml of a solution.

$$m = C \cdot V \cdot M = 0,1 \cdot 0,1 \cdot 69 \approx 1,0 \text{ г NaNO}_2$$

M.m. $\text{NaNO}_2 = 69 \text{ g}$;

2. Weight sodium nitrite sample on hand balance with 0,1 g accuracy.

3. Place solid sample in a conic flask add 150 ml distilled water and dissolve it.

4. To wash buret by NaNO_2 solution.

5. Using funnel to fill a buret by NaNO_2 solution and obtain absence of air bubbles in the tag of buret.

6. To take off funnel and show out the level of liquid in a buret to the zero mark.

7. Add exact amount of sulfanilic acid (0.2 g) $m = \underline{\hspace{2cm}} \text{ g}$

To Erlenmeyer flask add 30 ml of water and dissolve it.

8. To the received solution add 5 ml 2 M HCl, 5 ml of potassium bromide, 4 drops of a solution of tropeolin 00 and 4 drops of a solution methylene blue.

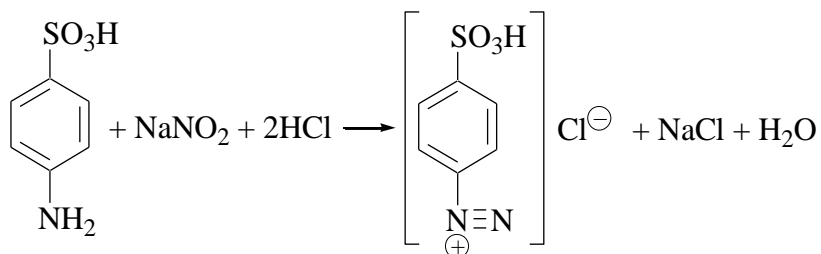
9. To put a flask with solution under a buret and a sheet of white paper under the flask.

10. Add titrant slowly: at first approximately with a speed of 2 ml/mines, and in the end of titration of 0,05 ml/minutes.

12. It is necessary to catch a moment when colour of solution change from red-violet to the blue.

12. To repeat titration procedure with new conic flask.

13. The reaction equation:



14. Calculation:

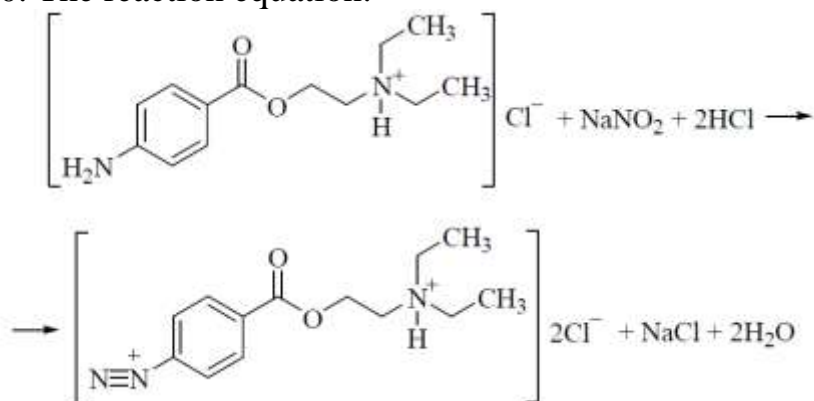
$$C(\text{NaNO}_2) = \frac{m(\text{C}_6\text{H}_7\text{NO}_3\text{S})}{M(\text{C}_6\text{H}_7\text{NO}_3\text{S}) \cdot V(\text{NaNO}_2) \cdot 10^{-3}}$$

$$M(\text{C}_6\text{H}_7\text{NO}_3\text{S}) = 173,19 \text{ g/mol}$$

Part 2. Definition of the maintenance of novokaine.

Procedure:

1. Using funnel to fill a buret by NaNO_2 solution and obtain absence of air bubbles in the tag of buret.
2. To take off funnel and show out the level of liquid in a buret to the zero mark.
3. Add exact amount of novocaine (0.25g) $m = \underline{\hspace{2cm}}$ g to Erlenmeyer flask. Weight the sample of novocaine on analytical balance.
4. Place solid sample in a conic flask add 25 ml 4 M HCl and dissolve it.
5. To the received solution add 1 g of potassium bromide, 4 drops of a solution of tropeolin 00 and 2 drops of a solution methylene blue.
6. To put a flask with solution under a buret and a sheet of white paper under flask.
7. Add titrant slowly: at first approximately with a speed of 2 ml/mines, and in the end of titration of 0,05 ml/minutes.
8. It is necessary to catch a moment when colour of solution change from red-violet to the blue.
9. To repeat titration procedure with new conic flask.
10. The reaction equation:



11. Calculation:

$$\omega(\text{C}_{13}\text{H}_{22}\text{ClN}_3\text{O}) = \frac{c_{\text{NaNO}_2} \cdot V_{\text{NaNO}_2} \cdot 10^{-3} \cdot M(\text{C}_{13}\text{H}_{22}\text{ClN}_3\text{O}) \cdot 100}{g},$$

$M(\text{C}_{13}\text{H}_{22}\text{ClN}_3\text{O}) = 271.8 \text{ g/mol}$

Part 3. Determination of streptocide.

Procedure:

1. Using funnel to fill a buret by NaNO_2 solution and obtain absence of air bubbles in the tag of buret.
2. To take off funnel and show out the level of liquid in a buret to the zero mark.
3. Add exact amount of novocaine (0.25g) $m = \underline{\hspace{2cm}}$ g to Erlenmeyer flask. Weight the sample of novocaine on analytical balance.
4. Place solid sample in a conic flask add 25 ml 4 M HCl and dissolve it.
5. To the received solution add 1 g of potassium bromide, 4 drops of a solution of tropeolin 00 and 2 drops of a solution methylene blue.
6. To put a flask with solution under a buret and a sheet of white paper under flask.
7. Add titrant slowly: at first approximately with a speed of 2 ml/mines, and in the end of titration of 0,05 ml/minutes.
8. It is necessary to catch a moment when colour of solution change from red-violet to the blue.
9. To repeat titration procedure with new conic flask.
10. By results of titration carry out calculations of the maintenance of streptocide.

$M(\text{C}_6\text{H}_8\text{O}_2\text{N}_2\text{S}) = 172,21/\text{mol}$

4. Calculations:

The results you present to teacher.