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GASOMETRIC METHOD OF RESEARCH

The gasometric method is a method based on the determination of the volume of gas formed as a result of a chemical reaction. In the modern laboratory, it is not easy to find a user-friendly instrument for analysing various objects and processes. The gasometric method can often be used to analyse pharmaceuticals, as well as in chemical, petrochemical, biochemical, food, nitrogen and other industries. Gas burettes are available in different shapes, sizes, accuracy, design and purpose. The shape of the burette depends on the composition of the gas to be analysed. If the gas consists of a single component, burettes with a cylindrical glass tube are used. This shape is convenient for counting volumes anywhere in the burette. For gases containing more than half of the impurities that are not absorbed in the process, burettes with an expansion at the top are used. For multi-component gases, when the content of the main gas and residual gas is to be determined accurately, burettes with expansion in the middle are used.

In order to fill the burette with gas, vessels with a locking liquid are used. It (the locking liquid) is selected in such a way that the gas under study does not dissolve in it. Or the locking liquid is pre-saturated with gas so that it does not absorb it during the experiment. The reservoir with the locking liquid is lowered down so that the liquid passes completely into the burette and squeezes all the air out of it.

Gasometric method is easy to use, does not require expensive reagents, is environmentally friendly in chemical reactions. Research using this method is fast, which saves time and makes the task of analysing a sample much easier.

With the help of gasometric method nowadays investigate: enzymatic activity of catalase; kinetics of decomposition of hydrogen peroxide; oxygen saturation of salt and fresh water; Analysis of the distribution of hydrocarbon parameters; determination of peroxidase activity. Determination of ascorbic acid content in plants.

The gasometric method can be recreated in the laboratory using available laboratory equipment to recreate a gas burette. The gas burette can be assembled from a laboratory stand, an equilibration jar, a rubber tube for the gas outlet, a glass tube with graduations and a flask stopper.

The reliability of the readings of the reproduced gas burette can be checked using the reference method. If the burette is airtight, the change of gas and the calculation of the mass of the substance according to the Mendeleev-Clapeyron equation will show relevant results.

In conclusion, we can emphasise the importance and the advantages and disadvantages of the gasometric method: research using this method is quick and accurate enough. This factor is complemented by: simplicity of equipment, availability and cheapness of reagents, and environmentally friendly reactions. The disadvantages include the limited choice of the object of analysis and the fact that the pressure of saturated water vapour is not taken into account, which, however, can be neglected at room temperature.

REFERENCES

1. Mieczkowski S.A. Analytical chemistry: textbook. – 2nd edition, revision and supplement. – Mn: Universitetskoe, 1991.-334 p.

2. Trifonova A.N. Qualitative and quantitative analysis. Laboratory practice: textbook-method. Manual for students of chemical faculty / A.N. Trifonova, I.V. Melsitova. - Minsk: Izd. centre BSU, 2011.-117 p.

3. Alekseev V. N. Course of qualitative chemical semi-microanalysis. Moscow: State Scientific and Technical Publishing House of Chemical REFERENCES 1964.-584 p.

4. Fundamentals of analytical chemistry. In 2 books. Textbook for universities / Yu. Dorokhova, V.I. Fadeeva et al. Edited by Yu.A. Zolotov. - 2nd edition, revision and additions. - M.: Vysshaya Shkola, 2000. - C.358.

5. Catalytic decomposition of hydrogen peroxide on a platinum catalyst in the presence of different media. StudFiles [Electronic resource]. - Access mode: https://studfile.net/preview/5396603/ Date of access: 20.02.2016

6. Gas burettes. Prime Chemicals Group [Electronic resource]. - Access mode: https://pcgroup.ru/blog/gazovye-byuretki/ Date of access: 01.11.2019

7. Determination by gasometric method of catalase activity under the influence of electrochemically activated water. IRDC [Electronic resource]. - Mode of access: https://www.izron.ru/articles/aktualnye-problemy-i-dostizheniya-v-estestvennykh-i-matematicheskikh-naukakh-sbornik-nauchnykh-trudo/sektsiya-39-analiticheskaya-khimiya-spetsialnost-02-00-02/opredelenie-gazometricheskim-metodom-aktivnosti-katalazy-pod-vozdeystviem-elektrokhimicheski-aktivir/ Date of access: 11.04.2016