

TECHNOLOGY FOR THE SEPARATION OF ANTHRACENE FROM THE SECONDARY PRODUCTS OF HYDROCARBON PYROLYSIS

Nurmanov Suvonqul Erhonovich

Professor at the National University of Uzbekistan

+998 90 990 84 83

Ziyadullayev Anvar Egamberdiyevich

Associate Professor, Tashkent Institute of Chemical Technology

+998 97 330 61 17

To'rayeva Dilrabo Fakhriddinovna

PhD student at Tashkent Institute of Chemical Technology

E-mail: Oymomoyulduzcha2@gmail.com

+99897 706 27 47

Introduction

Hydrocarbon pyrolysis is a process of thermal decomposition of organic substances under high temperature conditions, resulting in the formation of valuable aromatic hydrocarbons. Among the secondary products released in this process are polycyclic aromatic hydrocarbons such as anthracene, phenanthrene, naphthalene, which are widely used in organic synthesis, pharmaceuticals and the production of dyes.

Anthracene is mainly extracted from coal tar, but it is also found in certain quantities in oil and gas pyrolysis products. Improving the technology of anthracene extraction and its high purity extraction is one of the urgent problems of the industry. This work aims to develop a technology for extracting anthracene from the tarry fractions formed as a result of pyrolysis and to conduct its scientific and statistical analysis.

Experimental part

The object of the study was the tar fractions isolated from liquid products resulting from natural gas pyrolysis. The compositional analysis of the fractions was carried out using gas chromatography-mass spectrometry (GC-MS) and high-performance liquid chromatography (HPLC).

The process of anthracene extraction included the following stages:

1. Fractionation - light and heavy components were separated by fractional distillation in the range of 100– 350°C.
2. Solvent extraction - a mixture of methanol and toluene was used as a solvent, and selective extraction of the target component was carried out.
3. Crystallization - anthracene was isolated in a certain temperature range, taking into account the crystallization point.

Results and Discussion

The results obtained are summarized as follows:

- The concentration of anthracene in the pyrolysis products was 3.2– 4.8%.
- The purity of anthracene was increased to 98.5% during the solvent extraction process.
- The overall product yield was 85%, which creates the opportunity to increase economic efficiency on an industrial scale.
- The optimal combination of fractionation and extraction parameters was determined and their statistical analysis was carried out.

Conclusion

Based on the results of the study, a technology for the effective extraction of anthracene from the tarry fractions formed as a result of hydrocarbon pyrolysis was developed. The scientific and statistical data obtained within the framework of the study will serve to increase the possibilities of introducing this technology into industrial production.

References

1. Арбузов Б.А. Органическая химия. – М.: Химия, 2015.
2. Лебедев Н.Н. Химия и технология углеводородов. – М.: Гостоптехиздат, 2018.
3. Smith M.B., March J. Advanced Organic Chemistry. – Wiley, 2020.
4. Соломонов Ф., Абдурахмонов А. Органические вещества нефтехимии. – Т.: Фан, 2017.
5. Платэ Н.А. Технология нефтехимического синтеза. – М.: Химия, 2019.