WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 4, Issue 12, December, 2023

BENZENE VAPOR ADSORPTION IN ADSORBENTS ACTIVATED ON THE BASIS OF GOSSIPOL TAR

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Abstract

Water is of fundamental importance in the many processes that occur in nature and, therefore, in the development of industries and in the life of mankind. Poisonous gases contained in the air from industrial enterprises, various heavy metals, petroleum products, surfactants, dyes are found in wastewater[1]. Such wastewater is dumped into natural bodies of water, polluting water bodies and, as a result, can pose a great danger to man. Currently, while wastewater is being treated in most water treatment facilities using the filtration method, micro-macromolecules in the water are inefficient for purification from various organic waste. From this, the need to create effective adsorbents in the treatment of drinking and wastewater is increasing. This makes it possible to purify non-volatile substances in the polyaric pulp, which is often found in water, using carbon mineral sorbents (UMS) [2].

To obtain Ugle-mineral sorbents, a logon bentonite, an extract of the oil and oil industry gossipol tar was selected. Montmorillonite-rich Campanile bentonite has a high proportion of sodium ions, a high cation exchange capacity, making it possible to obtain various modified adsorbents from them [3]. The resulting adsorbents have the potential to extract heavy metals by reducing water hardness, not only purifying wastewater from inorganic impurities [4].

To obtain Ugle-mineral adsorbents, montmorillonite-rich Campan bentonite was obtained by heating LB for 2 hours at 2000C in unspoiled conditions, while Gossipol Mercury was obtained by heating GS-400 at 4000c for 2 hours at 2000C in unspoiled conditions, and GS-B by activating 8000c for 1.5 hours using water vapor. The dispersion rate using a grinder added in a ratio of 1:1 to each of the structural components of the UMS was crushed to 0.1 mm, and ugle-mineral adsorbents were taken, heated for 2 hours at 200-2500c in inhospitable conditions. The modified adsorbents were conditionally named as follows: LB:GS-400 (LBUMS-1), LB: GS-B (LBUMS-2).

The adsorption properties of the obtained adsorbents were studied according to the adsorption of benzene vapor.

Using the BET equation based on the isotherms obtained, adsorbents are given in the table below(table 1), monolayer capacitance(am), comparative surfaces(S),

saturation adsorption (as), microglove hajmi W0, mesoglove Wme=Vs-w0, and saturation adsorption voles Vs.

The bulk of benzene adsorption in adsorbents was found to be: lb-38.3%, GS da-400-41.3%, GS-Bda-36.8%, LBUMS-1da-31.4%, LBUMS-2da-24.2%, corresponding to the monocavate capacity of adsorbents (Table 1). Microgames were found to be high in the lbums-2, which was misplaced using the saturation theory equation, and in the microgames with respect to LBUMS-1.

Table 1. Sturucture-sorption indicators on benzene vapor adsorption in activated adsorbents

№	Adsorbents	Monoqavat sig'imi, α_m, mol/kg	Monocavate capacity, S m^2/g	Saturation adsorption,α_s, mol/kg	Microgovac khajmi $W_0 \cdot 10^3$, m^3/kg	Mesogovac khajmi $W_{me} \cdot 10^3$, m^3/kg	Thawing khajmi $V_s \cdot 10^3$, m^3/kg
1	LB	0,44	107	1,15	0,08	0,022	0,102
2	GS-400	0,62	149	1,5	0,12	0,058	0,173
3	GS-B	1,14	275	3,1	0,22	0,060	0,275
4	LBUMS-1	0,45	109	1,4	0,08	0,043	0,123
5	LBUMS-2	0,46	110	1,9	0,09	0,080	0,170

In Ugle-mineral adsorbents, it was found that in lbums-2, during the adsorption process, ~15% of benzene molecules are mustacham-bound to the property of π complés. In LBUMS-2, benzene adsorption is characterized by an abundance relative to other adsorbents, cracks in the adsorbent floor range, and a high porosity volume relative to other adsorbents. According to the results of benzene adsorption in adsorbents, it is possible to use these adsorbents in different areas, which gives the opportunity to overcome to some extent the demand of our Republic for adsorbents.

References

1. Юлдашев, Ж. Б., Бойматов, И. М., Маматалиев, Н. Н., Очилов, А. М. Ў., & Тлеубаев, С. О. (2020). ГИДРОФИЛЬНЫЕ СВОЙСТВА УГЛЕМИНЕРАЛЬНЫХ СОРБЕНТОВ НА ОСНОВЕ НАВБАХОРСКОГО ЩЕЛОЧНОГО БЕНТОНИТА. Science and Education, 1(7), 63-67.
2. Muminov, S. Z., Boymatov, I. M., Ergashev, O. K., & Khandamov, D. A. (2013). Теплота адсорбции паров пиридина на натриевом и полигидроксиалюминиевом монтмориллонитах. Сорбционные и хроматографические процессы, 13(4).

3. Boymatov, I. M., Eshmetov, I. D., & Xoshimov, S. H. (2020). M Adsorption of benzene vapors on modified coal-mineral adsorbents. UNIVERSUM Ximiya i biologiya,(Rossiya, Moskva) nauchn. jurn, 57-59.
4. Бойматов, И. М., Эшметов, И. Д., & Хошимов, Ш. М. (2020). Адсорбция паров бензола в модифицированных углеминеральных адсорбентах. Universum: химия и биология, (7 (73)), 57-59.
5. Boymatov, I. M., & Bobaev, I. D. Ramazanov NSh (2010) Ecdysteroids of the plant Lagochillus platycalyx. In VI All-Russian conference on chemistry and technology of plant substances. Thes. doc. conf (Vol. 312).
6. Yuldashev, JB, Boymatov, IM, Mamataliev, NN, Eshmetov, ID, & Tleubaev, SO (2020). NAVBAHOR KONI BENTONITLARI ASOSIDAGI KO‘GIR-MINERAL ADSORBENTLARNING ADSORPSIYON XUSUSIYATLARI. TABIY FANLAR VA TIBBIYOT MUAMMOLARINING XALQARO ILMIY SHARHIDA (14-20-betlar).