

# The Effect Of Sulfate Acid Concentrations On The Process Of Extraction Of Phosphate From Phosphorit Flour

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## Abstract

The article gives information about etymology and antropology of English and Uzbek personal names analized by linguists in both languages. As well as the stages of formation of famous Uzbek names and historical meanings of English names are included with examples completely. From time-to-time naming process developed relating to people lifestyle and regional concepts that they are given in exact periods.

**Keywords:** Anthroponomy, Etymology, Name origin, Translation, Religious names

To date, there are two methods of industrial production of phosphoric acid: dry (electric furnace) extraction and (wet) method. The process of recovering phosphorus from the product obtained by burning phosphates in blast furnaces, followed by oxidation in blast furnaces and subsequent dissolution in water is called thermal phosphoric acid (TPA), and the phosphoric acid extracted from the phosphate rock product with the participation of mineral acids is called extraction phosphoric acid (EPA). The concentration and purity of TPA are higher than that of EPA, but since its cost is much higher, phosphate fertilizers are produced from EPA.

In the experiment, EPA was isolated using the clinker method, which involves treating phosphorites with sulfuric acid.

For laboratory studies, phosphate raw material with the following composition was used: 17.76% P<sub>2</sub>O<sub>5total</sub>; 3.15% P<sub>2</sub>O<sub>5specific</sub>; 47.51% CaO; 1.79% MgO; 17.02% CO<sub>2</sub>; 0.95% Al<sub>2</sub>O<sub>3</sub>; 0.73% Fe<sub>2</sub>O<sub>3</sub>; 3.27% SO<sub>3</sub>; 2.26% F; 1.02% H<sub>2</sub>O; CaO:P<sub>2</sub>O<sub>5</sub> - 2.68 and 5.25% insoluble residue. The results obtained are presented in the table below.

In the experiments, sulfuric acid was used at concentrations of 70, 75, 80, 85, 90 and 93%, with a standard of 103%. The results obtained are presented in the table. It can be seen from the results in the table that when the sulfuric acid concentration increases from 70 to 93%, the percentage content of P<sub>2</sub>O<sub>5</sub> in the obtained EPA increases from 8.02 to 9.21%, the amount of CaO increases from 1.03 to 1.17%, and the amount of SO<sub>3</sub> increases from 3.12 to 3.39%. The amounts of P<sub>2</sub>O<sub>5total</sub> and P<sub>2</sub>O<sub>5aqueous</sub> in dry phosphogypsum increase from 2.40 to 2.58% and from 0.12 to 0.24%, respectively. CaO and SO<sub>3</sub> of the quantities and suitable from 29.48 to 29.84% respectively increase and 40.51 to 40.35% decrease observed. In the same standards K<sub>piece</sub> and Sorry suitable from 92.31 to 93.73% respectively and 90.34 to 91.70% increases. Filtering in this speed wet phosphogypsum from 1095 to 948 kg/m<sup>2</sup>·s was in the meantime lies Of course, this is filtering speed noticeable to the extent decrease happened However, when using a lower concentration (70-75%), large amounts of foam are also observed

## Derived EPA and phosphogyp c basic chemical composition

Substances amount, %							K <sub>piece</sub> , %	K <sub>div</sub> , %	Filtering speed, kg/m <sup>2</sup> ·s
Dry phosphogypsum									
P <sub>2</sub> O <sub>5</sub>	Health	SO <sub>3</sub>	P <sub>2</sub> O <sub>5th</sub> m.	P <sub>2</sub> O <sub>5w</sub> ater.	Health	SO <sub>3</sub>			
H <sub>2</sub> SO <sub>4</sub> concentration - 70%									
8.02	1.03	3.12	2.40	0.12	29.48	40.51	92.31	90.34	1095
H <sub>2</sub> SO <sub>4</sub> concentration - 75%									
8.25	1.07	3.16	2.45	0.14	29.52	40.48	92.76	90.45	1064

H <sub>2</sub> SO <sub>4</sub> concentration - 80%									
8.4 1	1.1 0	3.2 1	2.49	0.16	29.5 7	40.45	93.20	90.84	1011
H <sub>2</sub> SO <sub>4</sub> concentration - 85%									
8.7 5	1.1 3	3.2 9	2.53	0.19	29.6 5	40.42	93.38	91.23	985
H <sub>2</sub> SO <sub>4</sub> concentration - 90%									
9.1 2	1.1 5	3.3 5	2.56	0.22	29.7 3	40.38	93.61	91.62	964
H <sub>2</sub> SO <sub>4</sub> concentration - 93%									
9.2 1	1.1 7	3.3 9	2.58	0.24	29.8 4	40.35	93.73	91.70	948

This situation interferes with the normal course of the process. When using high concentrations of sulfuric acid (80-93%), large foams are also formed, but due to the low amount of water, the stability of these foams is much lower and interferes with the normal course of the reactions to a lesser extent. These results also show that the main chemical compositions of the EPA and dry phosphogypsum obtained at sulfuric acid concentrations of 90 and 93% are very close to each other. Therefore, in this case, sulfuric acid it is good concentrations of 90 and 93% to take possible.

### Used literature

1. Zakirova S. E., Najmiddinov R., Nodirov A. A. Phosphate From Raw Materials Extraction To Obtain Phosphoric Acid //International Conference on Global Trends and Innovations in Multidisciplinary Research. – 2025. – T. 1. – №. 4. – C. 63-64.
2. Nodirov A. A., Nozimov E. S., Azimjonov S. Extraction Phosphoric Acid From Washed Calcined Phosphorite Concentrate //TLEP–International Journal of Multidiscipline. – 2025. – T. 2. – №. 4. – C. 284-286.
3. Nodirov, A. A., Sultonov, B. E., Sherkuziyev, D. S., & Abdulxayev, A. A. (2025, July). Research of the composition of phosphogypsum produced during the extracting of phosphoric acid from mineralized mass by the clinker method. In AIP Conference Proceedings (Vol. 3304, No. 1, p. 040021). AIP Publishing LLC.
4. Nodirov, A. A., Sultonov, B. E., Abdullajanov, O. A., & Kholmatov, D. S. (2021). The clinker method of extracting phosphoric acid from Central Kyzylkum phosphorites. Scientific Bulletin of NamSU, 7, 69-75.
5. Sultonov B. E., Nodirov A. A., Xolmatov D. S. Research of the Composition of Phosphogypsum Produced During the Extracting of Phosphoric Acid from Ordinary Phosphorite Powder by the Clinker Method //Chemical Science International Journal. – 2023. – T. 32. – №. 2. – C. 51-58.
6. Avazovich Nodirov Alisher, Sultonov Bohodir Elbekovich, and Holmatov Dilshod Sattorjonovich. "The main chemical composition of phosphogypsum. formed at the obtaining of extraction phosphoric acid by clinker method." International scientific review LXXXIX (2023): 6-8.
7. Нодиров, А. А., Султонов, Б. Э., & Холматов, Д. С. (2022). Влияние нормы и концентрации серной кислоты на параметры экстракционной фосфорной кислоты, полученных клинкерным способом из мытого обожженного фосфоритового концентрата. Universum: технические науки, (3-5 (96)), 38-43.
8. Nodirov A. A. et al. Research of the composition of phosphogypsum produced during the extracting of phosphoric acid from mineralized mass by the clinker method //AIP Conference Proceedings. – AIP Publishing LLC, 2025. – T. 3304. – №. 1. – C. 040021.
9. Sadikjanovich N. E., Atxamjon o'g'li A. S., Avazovich N. A. MINERALLASHGAN MASSA VA FOSFORIT KUKUNIDAN FAOLLASHTIRILGAN FOSFORLI O'G'ITLAR OLISH



JARAYONLARI //Partner conferences of the International Scientific Journal Research Focus. – 2025. – T. 1. – №. 1. – C. 179-182.

10. Nodirov, A. A., & Kamilov, F. (2025, December). Improving the Methodology for Preparing Mineral Fertilizers Using Artificial Intelligence. In International Conference on Global Trends and Innovations in Multidisciplinary Research (Vol. 1, No. 6, pp. 68-73).
11. Nodirov, A. A. (2025, December). Method Of Extraction Of Phosphate Acid And Increasing Its Concentration. In International Conference on Global Trends and Innovations in Multidisciplinary Research (Vol. 1, No. 6, pp. 29-31).
12. Avazovich, N. A., & Sadikjanovich, N. E. Z. (2025, October). EKOLOGIK JIXATDAN ATROF-MUHITGA ZARARI KAM BOLGAN OGIT ISHLAB CHIQRISH. In Partner conferences of the International Scientific Journal Research Focus (Vol. 1, No. 1, pp. 120-123).