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CHEMISTRY AND TECHNOLOGY OF ENERGY SAVING PRODUCTS BASED ON LOCAL RAW MATERIALS

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Abstract:

This is due to the fact that the wear and tear of industrial equipment in thermal power plants is on average 91.73 percent. In 2015, "Uzbek¬energo" condensing thermal power plants had an efficiency of 28.4-42%, and the average was 33.5%. This is 1.5 times less than the indicators of modern thermal power plants of this type used in the European Union, Southeast Asia. Naturally, 1 kW. more heat and energy resources are used to produce electricity per hour compared to foreign electricity producers. For example, in 2015, 1 kW in modern thermal power plants of European Union countries. 269 grams of conventional fuel are used to generate electricity per hour, while this indicator reaches almost 374.9 grams in thermal power plants of "Uzbekenergo" JSC.

Keywords:

Ceramics, according, high temperatures; some, for example, yttrium-barium K, metal i. Ch, the specific and large, 269 - 300 grams of conventional fuel for electricity production.Undoubtedly

INTRODUCTION

Ceramics (from ancient Greek: kéromas [keramos] - soil) - non-metallic materials and objects obtained by baking soil (clay, kaolin) or inorganic substances at high temperatures[1]. K. in all areas: household (dishes), construction (bricks, tiles, pipes, tiles, wall decoration), engineering (radio engineering, electrical engineering, cosmonautics), railways, water and air transport, sculpture and applied arts. Widespread[2]. According to the structure, it is divided into coarse (consisting of unevenly distributed large particles, porosity 5-30%) and fine (consisting of evenly distributed small particles, porosity up to 5%) types. Small K. includes most building materials, copper, brick and tile, fine K. includes ceramics, porcelain, faience, piezo and ferrite ceramics, ferrites, cermets, some refractories, semi-porcelain and majolica[3]. According to the chemical composition, K. oxide, carbide, nitride, silicide, optical, etc. divided into types.

Oxide K. is characterized by high electrical resistance (10" — 1013 Ohm-cm), compressive strength (up to 5 GPa) and stability in an oxidizing environment at high temperatures; some, for example, yttrium-barium K. show superconducting properties at high temperatures (see Yttrium)[4].It is widely used in the preparation of porcelain, earthenware, ceramics, kaolin cotton, insulating materials, rockets, spacecraft, parts of nuclear reactors, radio engineering details, parts of memory devices, etc. ., as well as

materials obtained on the basis of titanium, (Ti), niobium (Nb), tungsten (W) carbides[5]. Carbide K. has high electrical and thermal conductivity, is resistant to oxygen-free environment (carborund K. is stable up to 1500° in oxidizing environment). Construction materials, electric furnace heaters, refractory materials, etc. used in preparation[6]. Nitride K. Boron nitride (BN), aluminum nitride (A1N), silicon nitride (Si3N4), (U, Pu) based on N, also containing silicon (Si), aluminum (A1), oxygen (O), nitrogen (N) or materials obtained by heating compounds containing yttrium (Y), zirconium (Zr), O and N. Such K. powder substance or compounds are heated at high temperatures (1700-1900°) under a pressure of 100 MPa in a nitrogen atmosphere and pressed while hot[7]. Nitride K. stability of dielectric properties, mechanical strength, heat resistance, chemical stability in various environments, etc. characterized by its properties. Metal i. Ch. equipment for industry, crucibles for melting some semiconductor materials, insulators, etc. i. used in Ch[8]. It is used instead of heat-resistant alloys made by adding cobalt (So), nickel (Ni), chromium (Sg), iron (Ge) to Si3N4. The most common type of silicide K. is K. obtained on the basis of molybdenum disilicide (MoSi2)[9]. It is characterized by low electrical resistance (170-200 μOhms), resistance to oxidizing environments (up to 1650°), metal solutions and salts. It is used in the preparation of electric heaters used in oxidizing environments.Optical K. made of fluorides, sulfides, phosphides and arsenides of some metals is used in infrared technology[10].

To prepare ceramic products, soil, kaolin, sand, feldspar, metallurgy and some industrial wastes are ground into powder in a ball mill and mixed with water; the mixture in the obtained liquid form is poured into pools with mixers; depending on the molding method,[11] it is dehydrated to a certain amount in filter presses or special spraying devices. Then, products are made from powder mixtures with a moisture content of 6-12% using presses, and from mixtures with a moisture content of 15-25%, by spreading, pressing, or pottery molding. Mixtures containing 25-45% water are molded by pouring into plaster, porous plastic and metal molds[12]. Molded products are dried and baked in special ovens heated from 900° (for construction K.) to 2000 (for refractory K.)[13]. Some types of K. are given additional mechanical processing and finishing after cooking. Pottery, porcelain, earthenware and other types of fine ceramics are coated with a glaze that creates a water- and gas-impermeable glassy layer and re-fired at 1000-1400°. In the preparation of heat-retaining porous materials, combustible additives (coal, sawdust, organic substances) that burn at high temperature are added to the clay[14].

The secrets of obtaining faience and glaze are known to the Egyptians in ancient times[15].They were discovered in China in the 3rd-4th centuries AD, in the Middle East in the 9th-10th centuries, in Central Asia in the Middle Ages, in France in the 16th century, in Germany and England in the 18th century, in Russia in the 19th-20th centuries. Developed[16]. Chinese porcelain and earthenware played an important role in the world history of K.'s development. He had a significant impact on the development of K. in many countries of Europe and Asia. In Central Asia, in Iran, Azerbaijan, Turkey, and Arab countries, the importance of K. in decorating buildings, using bubble terracotta, and making dishes was incomparable[17]. Polychrome mosaic tiling of buildings built in

Khiva, Samarkand, Bukhara, Kokand, Tashkent in the architecture of the 10th-15th centuries are considered the highest achievements of architectural art (see the technique and technology of cooking K[18]. products for many centuries, from a simple bonfire to a humdon, from a simple oven to mechanized ovens K.'s workshops, khumdons, and factories are operating in various countries, including Uzbekistan. Tashkent, Samarkand, Kuvasoy porcelain factories, ceramic factories in Angren and Rishton, there are khumdons in all regions of Uzbekistan[19]

One of the important conditions for achieving macroeconomic balance and stable growth rates is consistent continuation of structural changes in the economy, including increasing the share of finished products with high added value in production and exports through deep processing of local raw materials and materials. is multiplication[20]. The specific and large-scale reforms implemented in our country in the years of independence in this direction are creating a solid foundation for the great results being achieved[21]. The fact that the economy of Uzbekistan has grown 6 times over the past quarter of a century, despite the negative effects of the ongoing global financial and economic crisis, is a clear confirmation of this[22].

In order to strengthen the competitiveness of the national economy and implement a long-term strategy for implementing structural reforms, it is necessary to solve a number of other pressing issues[24]. In particular, the system of using energy resources in the country should be fundamentally revised and transition to a model of development that ensures energy efficiency is a necessity today[23].

Consequently, due to the pace of industrialization and the rapid growth of the population in our republic, energy consumption, especially the need for energy resources of economic sectors, is increasing significantly. Because according to UN forecasts, by 2030, the population of Uzbekistan may reach 37 million people.This, in turn, requires the conservation of hydrocarbon resources and their rational use. Why, the reserves of these raw materials are limited. According to calculations, if the current volume of resource consumption is maintained, in 2030 there is a possibility that the shortage of energy resources will be 65.4 percent of the total need.

Among hydrocarbon resources, natural gas deserves special attention. Because the dependence on natural gas in the structure of the needs of primary heat and energy resources in the electric power industry will increase from 85 percent. 42% of natural gas consumption is for electricity production, 27% for population, 26% for economic sectors. That is why, first of all, it shows the need to increase the efficiency of using natural gas for the production of electricity and thermal energy in thermal power plants (IES).

Unfortunately, today the current technical condition of the industry is such that the share of costs in the cost of products produced at the IES is on average 94.5 percent, and in some stations it is more than 100 percent. This is due to the fact that the wear and tear of industrial equipment in thermal power plants is on average 91.73 percent. In 2015, "Uzbek¬energo" condensing thermal power plants had an efficiency of 28.4-42%, and the average was 33.5%. This is 1.5 times less than the indicators of modern thermal power plants of this type used in the European Union, Southeast Asia. Naturally, 1 kW. more

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The construction of steam-gas and gas turbines currently being carried out at Navoiy, Tolimarjon, and Tashkent thermal power stations, as well as the fact that such works are planned for Toraqorgan, Takhiatosh, and Syrdaryo thermal power plants in the near future, will increase fuel consumption in the field. 1 kW. hour allows to reduce to 269 - 300 grams of conventional fuel for electricity production.Undoubtedly, these efforts serve to reduce the cost of electricity and thermal energy production, which is one of the strategic tasks of ensuring sustainable development in the energy sector.

High energy consumption in the chemical industry is itself the main reason for the increase in the cost of the product and its lack of competition. In the chemical industry enterprises of Uzbekistan, the share of costs in the production price is 99.7-100 percent. 64 percent of them are spent on energy resources. However, in foreign enterprises that use modern technology and equipment, this indicator is only 25-30 percent.

Calculations show that if a few energy-efficient facilities are launched in Uzbekistan, it is possible to reduce energy consumption by 2-2.5 times, and the cost of ammonia by 1.8 times. This situation is also observed in the production of other types of mineral fertilizers. For example, in the production of nitrogen, the share of energy resources in the product cost is more than 70 percent, and energy consumption is 2-2.5 times higher than abroad.

In general, a one percent reduction in energy consumption in the chemical industry allows for a 0.6-0.8 percent reduction in product costs.

The building materials industry is also a large consumer of heat and energy resources. The share of fuel and energy consumption in the production and sale of products in this area reaches 50%. This, of course, is the result of the fact that factories built in the last century still use outdated technologies. Today, the so-called "wet" method, which has a high energy consumption, is widely used in three cement production plants. For example, 286.7 kilograms, 246.6 kilograms, and 230 kilograms of conventional fuel are used in "Kuvasoysement" and "Bekobodsement" for the production of one ton of product in Ohangaronsement. Among the cement plants in our country, only "Kyzilqum¬sement" consumes less, i.e. 130 kilograms of conventional fuel. This is the result of the implementation of the "dry" method. However, this figure is 30 percent higher than that of similar enterprises in Japan and the Republic of Korea. In these enterprises operating in the "dry" method, the total consumption of conventional fuel does not exceed 120 kilograms per ton of clinker. Cement factories in China and Turkey have similar indicators. And it is they who enter the main competition with domestic manufacturers in the domestic market. As a result, our cement product is losing its competitive position due to the price factor.

Metal oxides, carbides, nitrides are used as raw materials for cermets. Cermets are divided into 2 groups:

1. Depending on the content:

a. Oxidized;

b. Nitrided;

c. Carbide;

d. Boridly.

2. Depending on the task:

a. Resistant to corrosion;

b. Heat resistant;

c. Corrosion resistant;

d.For nuclear reactors.

The most common types of cermets are based on Al2O3 and hard-to-melt metals (Mo; Nb; To). Composite Al2O3 -Ni(Co; Fe) is used.

Among the carbide cermets, the most common are those based on tungsten carbide and cobalt.

Carbide cermets together with cobalt, nickel, balsam, molybdenum, niobium, chromium, tungsten as a metallic component. Carbide-titanium cermets are more precise than their oxides, and are superior to heat-resistant steels in terms of long-term accuracy. Cermets based on chromium and zirconium dibaride are resistant to sudden heat shock ("thermal shock").

Dispersed KKM are used in the manufacture of responsible parts:

1. Working at high temperature;
2. For small tools;
3. Indestructible;
4. Stamps;
5. Filbera;
6. Bearings;
7. Valves operating in hazardous environments.

Oxide-based ceramets are used as hot (in furnaces) gauge-thermocouple spheres. Internal combustion engine parts are made of metal-ceramic materials based on silicon and aluminum.

REFERENCES

1 Bafoev, A. X., Rajabboev, A. I., Niyozov, S. A., Bakhshilloev, N. K., & Mahmudov, R. A. (2022). Significance And Classification of Mineral Fertilizers. Texas Journal of Engineering and Technology, 5, 1-5.

2 R.A. Makhmudov, K.Kh. Majidov, M.M. Usmanova, Sh.M. Ulashov, & S.A.Niyozov. (2021). Characteristics Of Catalpa Plant As Raw Material For Oil Extraction. The American Journal of Engineering and Technology, 3(03),70–75. https://doi.org/10.37547/tajet/Volume03Issue03-11

3 Hujakulova, D. J., Sh M. Ulashov, and D. K. Gulomova. "TECHNOLOGY OF DEODORIZATION OF SOYABEAN OIL." Galaxy International Interdisciplinary Research Journal 9.12 (2021): 171-174.

4 Shodiev Z. O., Shodiev S., Shodiev A. Z. THEORETICAL BASIS OF EFFECTIVE SEPARATION OF COTTON FROM AIR FLOW //Современные инструментальные системы, информационные технологии и инновации. – 2021. – С. 12-15.

5 Ниёзов , С., Шарипов, Ш., Бердиев, У. ., Махмудов , Р. ., & Шодиев , А. . (2022). ТРУЩИНЫ, ВЫПУСКАЮЩИЕСЯ ПРИ ПРОИЗВОДСТВЕ ХЛОРИДА КАЛИЯ ИЗ СИЛЬВИНИТОВОЙ РУДЫ. Journal of Integrated Education and Research, 1(4), 440–444. Retrieved from https://ojs.rmasav.com/index.php/ojs/article/view/302

6 Ниёзов С.А., Шарипов Ш.Ж., Бердиев У.Р., & Шодиев А.З. (2022). ВЛИЯНИЕ НИТРАТ И НИТРИТОВ НА ОРГАНИЗМ. Journal of Integrated Education and Research, 1(4), 409–411. Retrieved from https://ojs.rmasav.com/index.php/ojs/article/view/301

7 Amanovich, M. R., Obitovich, M. S., Rakhmatilloyevich, T. H., & Oybekovich, S. Z. (2021). The use of biological active additives (BAA) in the production of flour confectionery products. The American Journal of Engineering and Technology, 3(05), 134-138.

8 Mahmudov Rafik Amonovich, Shukrullayev Javohir Oybek ugli, Ereshboyev Husniddin Fazliddinovich, & Adizova Muqaddas Odil kizi. (2022). Improvement of Technology of Gypsum Production Raw Materials and Products in Production. Texas Journal of Multidisciplinary Studies, 6, 182–184. Retrieved from https://zienjournals.com/index.php/tjm/article/view/1059

9 Фатиллоев, Ш. Ф., Ш. Б. Мажидова, and Ч. К. Хайруллаев. "ВЛИЯНИЕ ДОБАВОК АЗОТНОКИСЛОТНОГО РАЗЛОЖЕНИЯ ФОСФОРИТОВ ЦЕНТРАЛЬНОГО КЫЗИЛКУМА НА ГИГРОСКОПИЧЕСКИЕ СВОЙСТВА АММИАЧНОЙ СЕЛИТРЫ." Gospodarka i Innowacje. 22 (2022): 553-556.

10 Kazakovich, Khayrullayev Chorikul, Fatilloyev Shamshod Fayzullo o'g'li, Dehkonova Nargiza, and Jabborova Aziza. "STUDY OF THE POSSIBILITY OF USE OF LOCAL PHOSPHORITES AND SEMI-PRODUCTS OF THE PRODUCTION OF COMPOUND FERTILIZERS AS ADDITIVE TO AMMONIA NITRETRE." EPRA International Journal of Research and Development (IJRD) 7, no. 4 (2022): 49-52.

11 Фатиллоев, Шамшод Файзулло Угли, Бехзод Мавлон Угли Аслонов, and Алишер Камилович Ниёзов. "ИЗУЧЕНИЕ МЕХАНИЧЕСКИХ СВОЙСТВ КОЖИ ОБРАБОТАННЫМИ ПОЛИМЕРНЫМИ КОМПОЗИЦИЯМИ." Universum: технические науки 11-4 (80) (2020): 49-51.

12 Исматов С. Ш., Норова М. С., Ниёзов С. А. У. Технология рафинации. Отбелка хлопкового масла с местными адсорбентами //Вопросы науки и образования. – 2017. – №. 2 (3). – С. 27-28.

13 Ниёзов, С. А., Махмудов , Р. А., & Ражабова , М. Н. (2022). ЗНАЧЕНИЕ АЗОТНОЙ КИСЛОТЫ ДЛЯ НАРОДНОГО ХОЗЯЙСТВА И

ПРОМЫШЛЕННОСТИ. Journal of Integrated Education and Research, 1(5), 465–472. Retrieved from https://ojs.rmasav.com/index.php/ojs/article/view/315

14 Niyozov Sobir Ahror o‘g‘li, Fatilloyev Shamshod Fayzullo o‘g‘li, & Bafoev Abduhamid Hoshim o‘g‘li. (2022). Non-Ferrous Metals and Their Alloys New Innovative Technologies in Production of Non-Ferrous Metals. Neo Science Peer Reviewed Journal, 3, 11–20. Retrieved from https://www.neojournals.com/index.php/nsprj/article/view/31

15 Narzullaeva, A. M., Khujakulov, K. R., Tursunova, D. H., & Teshaeva, M. S. (2020). Study of the Influence of the type of the catalyst on the technological process of hydration of higher fatty acids into alcohols, optimal parameters of the process, the industry of use of higher alcohols. International Journal of Advanced Research in Science, Engineering and Technology, 7(11), 15954-8.

16 Mahmudov Rafik Amonovich, Shukrullayev Javohir Oybek ugli, Ereshboyev Husniddin Fazliddinovich, & Adizova Muqaddas Odil kizi. (2022). Improvement of Technology of Gypsum Production Raw Materials and Products in Production. Texas Journal of Multidisciplinary Studies, 6, 182–184. Retrieved from https://zienjournals.com/index.php/tjm/article/view/1059

17 Худойбердиев Н. С., Ҳайдарова М. Ф. ПРОЦЕСС МОДИФИКАЦИИ ЖИДКОГО СТЕКЛА ПОЛИМЕРАМИ //Galaxy International Interdisciplinary Research Journal. – 2022. – Т. 10. – №. 10. – С. 39-41.

18 Ahror o‘g‘li, N. S., & Ahadovna, M. M. (2022, November). UCHTUT DOLOMITE MINERAL OF MINERALOGICAL PROPERTIES, CHEMICAL COMPOSITION AND EXTRACTION OF MAGNESIUM CHLORIDE. In E Conference Zone (pp. 79-87).

19 Niyozov, S., Amonova, H. I., Rizvonova, M., & Murodova, M. A. (2022). MINERALOGICAL, CHEMICAL COMPOSITION OF UCHTUT DOLOMITE MINERAL AND PHYSICO-CHEMICAL BASIS OF PRODUCTION OF MAGNESIUM CHLORIDE. Journal of Integrated Education and Research, 1(6), 32-38.

20 Ahror o‘g‘li, N. S., Amonovich, M. R., & Komil o‘g‘li, B. N. (2022). METHODS OF BENEFICIATION OF POTASH ORES AND POTASH MINES. European Journal of Interdisciplinary Research and Development, 9, 59-69.

21 Ahror o‘g‘li, N. S., Amonovich, M. R., & Ilhom o‘g‘li, R. A. (2022). PHYSICO-CHEMICAL PRINCIPLES AND TECHNOLOGY OF PRODUCTION OF MAGNESIUM CHLORATE DEFOLIANT BASED ON LOCAL RAW MATERIALS AND SECONDARY PRODUCTS. Web of Scientist: International Scientific Research Journal, 3(11), 224-234.

22 Ismatov S. S., Norova M. S., Niyozov S. A. U. Refining technology. Bleaching of cottonseed oil with local adsorbents //Science and Education. – 2017. – №. 2. – С. 3.

23 Ahror o‘g‘li N. S., Murodullo o‘g‘li O. J., Ziyadulloyevich S. A. PHYSICO-CHEMICAL PROPERTIES OF RAW MATERIALS USED TO OBTAIN FINE CERAMICS //World scientific research journal. – 2022. – Т. 10. – №. 1. – С. 156-167.

24 Oybek o‘g‘li S. J., Ahror o‘g‘li N. S., Odil o‘g‘li U. O. RESEARCH OF THE CHEMICAL COMPOSITION OF CONSTRUCTION MATERIALS BASED ON MINERAL BINDERS //World scientific research journal. – 2022. – Т. 10. – №. 1. – С. 9.