CALCULATION OF ENERGY CHARACTERISTICS OF SOLAR HEATING SYSTEM.

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Annotation: *This article provides for the use of non-traditional energy sources and heating of residential buildings by converting solar energy into thermal energy.*

Key words: *helium core, sun, thermonuclear fusion, solar energy, heat source.*

Currently, modern types of building heating are emerging. The sun, which is the source of life on our planet, is one of the middle stars in the Milky Way constellation, and, according to scientists, its diameter is 1.39 million. km, has a mass of 2□1030 kg and an average density of 1.4□103 kg/m3.

The distance from the center of the Sun to the center of the Earth is 150 million. km, varies by □ 1.7% during the year, and sunlight reaches the Earth's surface in 8.3 minutes. The temperature on the surface of the Sun, that is, in the photosphere, is 5762 K.

According to various calculations, the temperature in the central part of the Sun is 8□40□106 K, and the density is 80□100 t/m3. Under such physical conditions, the Sun can be thought of as a fusion reactor in continuous motion.

As a result of the fusion of one hydrogen isotope of deuterium (2H) and one tritium (3H) during the fusion reaction occurring on the Sun, one helium nucleus (4He) is formed, i.e. 2H + 3H □ 4He + n + E. The mass of the resulting helium nucleus is equal to one deuterium and one since tritium is less than the sum of the masses of hydrogen isotopes, the mass difference before and after the reaction - □m is recalculated into the amount of radiant energy according to the Einstein formula (s = 3□108 km/s is the speed of light in vacuum).

According to scientists' calculations, with this type of thermonuclear reactions, the mass of the Sun is 4.2 million per second. decreases by tons, and as a result, the Sun

emits 3.8□1026 W of radiant energy. According to the results of not so complicated calculations, despite the rapid decrease in the mass of the Sun, the decrease in the energy of its radiation by only 0.1% is 15 trillion. could happen in a year.

If the average radius of the Earth is 6370 km, and the average distance from the Sun to the Earth is 149.6 million If we take into account that this is 2.2 billion km of the above power (3.8□1026 W). part of it reaches the Earth and forms a stream of radiant energy with a surface density equal to 1353 W/m2 at the surface level located perpendicular to the sun's rays at the boundary of the earth's atmosphere.

The territory of our republic is located in a favorable climatic region for the use of solar energy in various areas of the national economy (ie between 37° and 45° north latitude). The maximum power of solar radiation incident on the surface reaches 1 kW. . The total amount of solar energy that falls on each square meter of the territory of our republic during the year is 5900□6300 MJ (that is, 1650□1750 kWh), which is numerically equal to the amount of thermal energy released when 200□215 kg of standard fuel is burned. .

The annual technical potential (i.e. resource) of sulfur energy in our republic is 290 million equal to the amount of standard fuel per ton, which is 4 times more than the total amount of primary energy resources used for domestic needs of our country during the year.

One of the directions that are considered technologically ready for the practical use of solar energy in our republic, as in other countries of the world, is the conversion of solar energy into thermal energy and its use to partially cover the population's need for thermal energy.

Devices that convert solar energy into thermal energy are called solar thermal devices or solar heaters. Solar heaters can be conditionally divided into 2 types depending on the potential of the thermal energy they produce, that is, the temperature of the coolant. The most widely used solar heaters in the household are mostly flat and are used when the temperature of the coolant does not exceed 100°C. A coolant with such a temperature, such as water, can be used in hot water supply systems for various consumers, heating residential buildings, industrial and agricultural facilities in the winter season, desalination of salt water, and similar purposes. If air is used as a heat carrier, such devices can be used for drying fruits and vegetables in the summer. To heat the coolant temperature to 200□300 °C and even higher, devices are used that are designed to work with the help of collected, that is, concentrated sunlight. Devices of this type can be used mainly for the purpose of boiling water to produce steam and from it as a source of high-temperature heat, including for generating electricity, as in conventional power plants.

The external views of devices made on the basis of flat solar heaters and put into practice in Tashkent are shown.

Solar energy converted into thermal energy can be used to heat residential buildings in winter. But if we consider that in winter the ambient temperature drops, and the amount of energy coming from the sun decreases by 2-2.5 times compared to summer, it turns out that it is much more difficult to use solar energy for heating buildings than hot water supply. systems. Therefore, it is difficult to heat buildings with 100% solar energy. However, using thermal energy obtained from solar heaters installed on the roof or side walls of the building, it is possible to save 30-40% of the fuel needed to heat the building in the winter season. Solar heating systems are conventionally divided into 2 types, called active and passive systems, depending on the presence or absence of auxiliary equipment such as pumps, fans and automatic controllers used in these systems.

In active systems, solar heaters are placed outside the building, for example, on the roof, and the water heated in them is pumped to heating equipment located inside the building, i.e. to radiators. On cloudy days and in the evenings, traditional liquid fuel heaters are used to heat the building.

Solar energy converted into thermal energy can be used to dry fruits and vegetables during the summer season. Air heated to 65-70°C in solar heaters is sent to the drying chamber. Wet products in the chamber are heated up to 60-65 oC under the action of hot and dry air and evaporate the moisture contained in it due to the heat received. In conclusion, it can be said that the use of solar energy in the future will attract all industries and I think that it will pay off.

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