Consequences of accidents of NPP.

Valeri I. Kotelnikov, academic secretary, Tuvinian Research Institute of Siberian Branch of Russian academy of sciences. 117 A, International st., Kyzyl, Tuva,Russia, 667007.

Phone/fax: +7 394 22266214

e-mail: tikopr@mail.ru

In this paper, I presents a way of reducing leakage of contaminated water and radioactive waste of NPPs. The problems of decontamination and recycling of radioactive water, disposal of radioactive waste, a number of which accumulates in nuclear power plants is a very important in the present time. Use of CNH matrixes for increasing negative properties of radioactive waste and water is a one of way to do it quick, cheap and safe.

Radioactive contamination, also called radiological contamination, is the deposition of, or presence of radioactive substances on surfaces or within solids, liquids or gases (including the human body), where their presence is unintended or undesirable.

The problem of decontamination and recycling of radioactive water, disposal of radioactive waste, a number of which accumulates in nuclear power plants has not yet been resolved. Exhaust nuclear fuel in the world has accumulated about 240 thousand tons. A serious problem with the cleaning and disposal of radioactive water has occurred. A particularly acute problem of disposing of radioactive water in the aftermath of nuclear accidents need to be solved.

We know tens of accidents on power stations in the world. In many cases, to liquidation of consequences of these accidents we need use a large amount of water, which then creates an additional problem. Cases of widespread radioactive contamination include the Bikini Atoll, the Rocky Flats Plant in Colorado, the Fukushima Daiichi nuclear disaster, the Chernobyl disaster, and the area around the Mayak facility in Russia.

Leakage of radioactive water has become a major issue now. For example, at the NPP "Fukushima -1", in August this year, the station of ground steel storage spilled 300 tons of highly radioactive water that could partially get into the ocean. This incident is considered the largest leak of contaminated liquid from the date of the accident itself.

According to the company report, leaks determined by 11 separate sites for groups of vessels, which are surrounded by concrete barriers. The highest level of strontium 90 in the H2 area is about 710 becquerels per liter of water. This exceeds the rate of about 70 times.

In the air of the Japanese nuclear power plant, "Fukushima -1" dramatically increased the level of radiation exposure that caused two members of the station.

Leakage of contaminated water is one of the major problems that are addressed by liquidators of the accident at the nuclear power plant "Fukushima -1". At the March of this year in

the basement premises, drainage system and special tanks of the station has accumulated more than 360,000 tons of water with varying rates of radioactive substances. In late July, TEPCO is also the first time admitted that radioactive water from the plant area continues to flow into the Pacific Ocean.

On the territory of the nuclear power plant "Fukushima -1" in Japan was determined a sharp increase in the level of radiation in samples of groundwater. The concentration of tritium, for example, exceeded the permissible values in the six half thousand times. Still acute in the "Fukushima -1" is the problem of leakage of radioactive water, experts say.

According the above we can suggests the following solution:

- To reduce the possibility of spontaneous leakage of contaminated water by increasing its viscosity.

- To extract the suspended matter and possibly dissolved in water radioactive elements and separate them from the liquid. Isolate the solid waste and recycle liquid waste, transforming them into the solid state.

These problems can be solved by adding into contaminated water carbon nanostructured heterogeneous (CNH) material (matrix) in a fine condition (Figure 1). The formed viscous liquid will be less fluent, thus will reduce spontaneous leakage cases. Contemporaneously, the waste liquid is filtered through a matrix, the solid components will be adsorbed therein, the liquid can be easily removed for posterior processing. CNH material at the same time will reduce the level of radiation contaminated water as a best baffler and catcher for ionizing radiation.

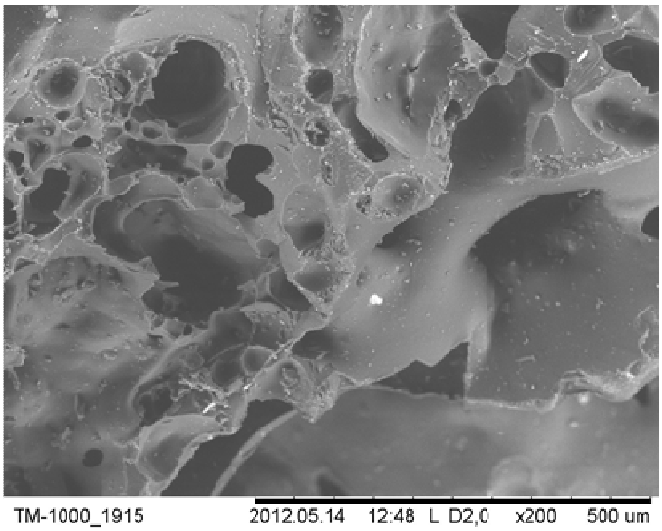

Figure 1. Carbon nanostructured heterogeneous (CNH) material (matrix).

The structure and adsorption properties of a new micro-and nano-structured carbon matrix synthesized by the author’s idea was studied. Sorption capacity of the matrix is at cations strontium (II) 65 mg / g, and at the water is 285.7 mg / g. Matrix effectively removes strontium cations from aqueous solution. It indicate that the prospect of its application for purification of water man-made

environments. Given the ability of the matrix to the absorption of ionizing radiation may use it to deactivate radioactive solutions.

Experiments have shown that the matrix, in contrast to other materials to reduce the radiation intensity of the background index.

Experiments have shown that the matrix, in contrast to other materials (coke, for example) to reduce the radiation intensity of the background index better.

After filtration, the water is separated from the slurry CNH material which adsorbed solid radioactive particles, will be mixed with binders to isolate the pores and prevent exit of waste accumulated out of matrix. The material after filtration may be used for producing blocks which are then fed to storage. The CNH matrix is well insulates and prevents the waste emissions of ionizing radiation. Filtered water will have significantly lower activity and can be stored as a mix with CNH material.

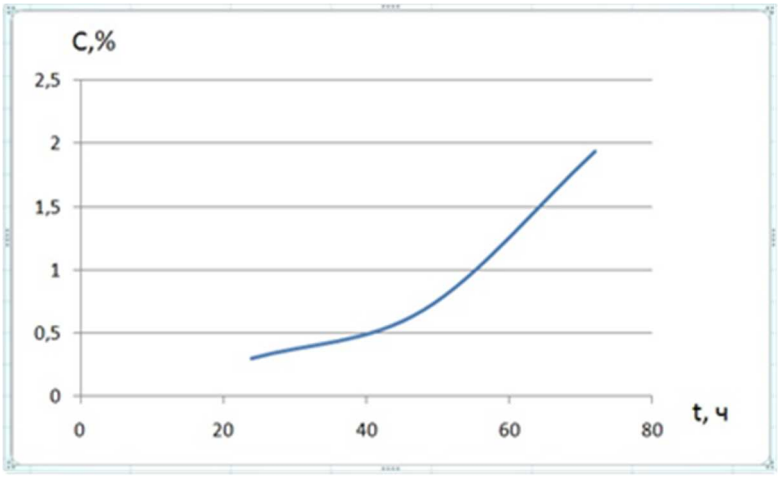

Figure 3. Dependence concentration strontium C% by time of filtration.

Purified water from radioactive impurities comprises tritium, which can be isolated in the polymer structures, such as polyethylene for example, by replacing hydrogen by tritium using known schemes.

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