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Ionogenic adsorbents based on local raw materials for radiation protection

The successful management of uranium wastes and creating the conditions for effective rehabilitation activities require special adsorbents capable of holding on the surface complexes, including radioactive elements.

Currently tested and have shown promising synthetic adsorbents based pitted apricot fruits and other fruit plants. This report presents data for the establishment of ionic type available adsorbents based on Tajikistan coal. As the base for the creation of this type of adsorbent were taken the coal of the "Ziddi" deposits. As follows from our data on the chemical composition, the studied coals contain more than 20% of the ash. According to the available literature these ashes contains various minerals compositions that can form the adsorbent's active surface. Thus, the model for this type of activated carbon can serve as a mixture of zeolite, ion exchange resins and activated carbon itself.

Activation of coal was carried out by anaerobic thermal decomposition in the temperature range up to 600⁰C in a specially constructed for this purpose reactor.

Adsorption capacity was determined in accordance with GOST 6217-74. For comparison, similar measurements were made for a series of different bentonite deposits in Tajikistan, which are used as wide spectrum adsorbents. The minimum value of the adsorption capacity corresponds to GOST 30% uptake of iodine from solution KJ.

The determined values of the adsorption capacity in this case depends on the granule size range from 24.7% to 54% as shown in Table.

Coal granule size (mm)	Adsorption capacity (%), related to 1 gram of activated carbon
0.56	24.7
0.25	26.1
0.063	54.0

In the same conditions the adsorption capacity the samples of bentonite deposit "Topkok", "Istentau" and "Sultanabad" were ranged from 0.07% to 4.02%.

The adsorption capacity of activated carbon related to organic macromolecular motor and oils from the surface water showed their high efficiency.

Currently the adsorption properties of coal related to heavy metals is under preliminary testing.