

Ways to utilize by-products in the production of silica from rice husk

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Abstract

The development of modern technologies for the use of rice husk (RH) as a raw material for the production of silicon dioxide (DC) is relevant. However, in the process of obtaining DC from RH, as a rule, solutions of acids and alkalis use. This makes it important to search for rational ways to regenerate these liquids and utilize exhaust gas emissions into the atmosphere in order to solve the problems of environmental protection.

In the synthesis of DC based on RH, the following wastes are obtained: solid – carbon, liquid – solutions of hydrochloric acid and sodium oxide, exhaust gases. For utilization of the latter, it is effective to use the absorption purification method, based on the absorption by liquid reagents of toxic gases and vapors from their mixtures with air. The resulting sludge can be effectively used as a filler, in the manufacture of pavements (for example, asphalt).

The resulting acidic wastewater can be used to neutralize alkaline solutions. After neutralization, in addition to discharging into the environment, these wastes can be used as chemical fertilizers (since they contain sodium chloride).

Carbon can be used in the production of effective sorbents used, for example, to eliminate oil spills in environmental emergencies.

Silicon dioxide obtained from rice husk is an effective filler of epoxy polymers, increasing their hardness, wear resistance and improving antifricition characteristics. It provides acceleration of the curing process and the formation of more denser cross linked structure of filled materials. The nature of the modifying action of silicon dioxide does not depend on the temperature of burning rice husk, which affects only the magnitude of the effects achieved.

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