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NEW OIL SORBENTS BASED ON WASTES OF PLANT MATERIALS PROCESSING

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One of the most important aspects of the protection of ecological purity of the hydrosphere of refining industry enterprises is the issue of improving the structure of water consumption and spillway. The main pollutants present in the wastewater are oil refineries, suspended solids, salts, organic compounds, phenols, ammonia nitrogen, dissolved hydrogen sulfide. The rate of accumulation of petroleum products as a result of anthropogenic pollution in water and soil ecosystems is far ahead of their rate of biodegradation in a natural way, and existing technologies do not allow to cope with such contamination quickly and efficiently. Perspective direction of intensification of treatment processes of wastewater containing toxic and difficult-oxidized substances is a biosorbtional method that does not require significant capital expenditures. The essence of this method is the use of high concentrations of biomass on the media. In this case, the sorbent has a dual function: firstly, it is the carrier of immobilized microorganisms; secondly, because of its great sorption capacity provides quick adsorption of toxic substrate. New solution in our research is non-reagent physical-chemical treatment of natural materials (wastes of processing of agricultural products, wood processing enterprises wastes) for getting oil sorbents. The most attractive substances for their production are natural organic raw materials and waste products of plant origin. They usually are an integral part of ecosystems. Therefore, sorbents based on it are most relevant to environmental requirements. Natural sorbents are suitable for the process wastewater treatment from organic and oil products with medium and high molecular weight. Promising oil sorbents are sorbents based on the husk of cereals, rice, barley, wheat. Their action is particularly effective in the collection of the heavy oil fractions. Using microorganisms immobilized on various media during the process of the local sewage treatment allows to achieve a high degree of biodegradation (95-97 wt.%) of pollutants for a relatively short period of time. The proposed method of treatment has several advantages:

– ease of implementation;
– the ability to regenerate the sorbent;
– environmental safety of the cleaning process;
– relatively low cost of obtaining and using the sorbent.

During the regeneration of spent sorbent recovered oil products, which can be sent for recycling, are extracted from it or disposed. The spent sorbent not regenerated cannot be used in production of new materials of functional applications. The uniqueness of project is the development of modern rational technology of sewage treatment in the enterprises of oil industry with the introduction of new solutions in the technological scheme of sewage treatment, which allows to reduce the discharge of pollutants: oil is not more than 0.2 mg/l; phenol not more than 0.09 mg/l; suspended particles no more than 20 mg/l; chlorides (as Cl-)are not more than 600 mg/l; sulfates (as SO42-) are not more than 450 mg/l; surfactant not more than 0.4 mg/l.

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