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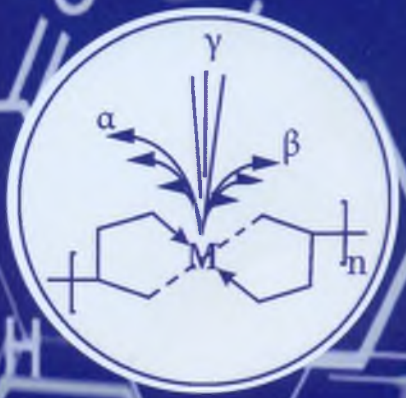

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APPLICATION OF COMPOSITE MATERIALS BASED ON POLYVINYL ALCOHOL DURING SOIL PHYTOREMEDIATION

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Soil is one of the most important natural resources, the state of which largely determines the ecological balance of the planet. The main characteristic of the soil is the fertility, which is formed by the activity of microorganisms. Economic activity leads to soil contamination, reduction of economic and potential fertility.Soil Contamination with oil and petroleum products is currently an urgent problem. Extraction of oil from the subsoil, purification and transportation are not only technically difficult, but also dangerous processes, since it is impossible to preserve natural environmental conditions during the development of deposits. Inevitably, each stage of production is accompanied by oil leakage, which can cause incorrigible situations. Chronic oil spills are a serious threat to the environment and human heaith.Microorganisms along with plantsandanimalstakeanindirectpartin thedecompositionof oil. If the soil is contaminated with oil, it is possible to inhibit the growth of plants and the activity of soil animals, which in turn can have an impact on microbial activity. Loosening the soil with plant roots, earthworms and burrowing arthropods improves soil drainage and facilitates gas exchange. In addition, burrowing animals can move organic material to biologically active surface layers of soil. Plants and especially legumes enrich the soil with nitrogen and biologically active compounds, which stimulates the growth of microorganisms and, accordingly, increases the intensity of oil decomposition.

In the proposed work, filıns were obtained by ınechanical mixing, in the presence of a glycerin plasticizer. Polyvinyl alcohol (PVA) and chitosan (Ch) were taken as initial reagents. Solutions of polyvinyl alcohol and chitosan with a concentration of 1% were prepared to produce films. PVA solution was obtained by dissolving in distilled water at a temperature of 70-75oC in a thermomagnetic stirrer, chitosan solution was obtained by dissolving in 1 % acetic acid at room temperature. The films were obtained by mechanical mixing of two solutions in the presence of a glycerin plasticizer with a concentration of 0.5 wt.%. Then the films were poured into Petri dishes and dried. The solubility of films in organic solvents and in distilled water was investigated. It was shown that the solubility of filıns in distilled water is higher than in organic solvents. For the obtained films were removed IR spectra, which observed absorption bands characteristic of the structure of polysaccharides and alcohol. Also, it is shown that polyvinyl alcohol and copolymers of chitosan stabilized by hydrogen bond. The mechanical properties of these films were studied. It is found that with increasing molecular weight of PVA and the content of polysaccharide their interaction and strength properties decrease.

During the study, the obtained films based on polyvinyl alcohol and chitosan were used in the process of phytoremediation. In the laboratory, the plant was grown in oil-contaminated soil, in the presence of the resulting copolymer. Were taken 3, 6, 9% oil by soil massand 0.1 g polymer. In the course of the experiment, it was studied that soil contaminated with 6% oilby soil mass stimulates plant growth, when soil contaminated with 9% oil by soil massadversely affects plant growth. Also, to determine the effect of films based on [PVA]:[Ch] on the process of phytoremediation, soil extraction was carried out. It was found that the use of plants and copolymers [PVA]:[Ch] in the phytoremidiation of oil-contaminated soils by extraction gives a high degree of purification (86.9%).

Thus, the polymer films based on PVA can be used in the process of phytoremediation for the cleaning of oil-contaminated soils.

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