

USE OF CHEMICAL MODIFIED STARCH IN AGRO-ALIMENTARY WASTES VALORIZATION

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The exploitation of green materials gained much more attention from various fields of science. In plants, the most representative biomaterial are cellulose and starch. There are many studies in which biopolymers, such as starch, chitosan, cellulose and lignin are used to solubilize persisting hydrocarbons. The sources of these bio-polymers are green materials, insects or agro-industrial wastes.

Agro-industrial wastes are present in high proportion under the form of biodegradable types of wastes which can be the result of different activities: horticulture, viticulture (branches, leaves, etc.), crops (straw, leaves, etc.), wastes from livestock (manure) and other industrial activities.

The prevention of environmental pollution increases the attention regarding the rationalization of the agro-industrial cycle in order to stimulate possible exploitation of residual vegetables. There is a growing interest in the recycling of biomasses of agro-industrial origin through extraction, reuse and upgrading. Wastes from agro-industries can be used in biotechnologies processes such as the production of value-added compounds and substrates for microbial isolation.

The limitations of POPs destruction are due to higher molecular weight, low water solubility and low availability. PAHs, in particular naphthalene, anthracene, and pyrene are known to be strongly absorbed to soil particles. Also, pyrene, a molecule with higher molecular weight, exhibits a low bioavailability (low water solubility). The main sources of PAHs are incomplete combustion, digenetic processing of organic matter, to a smaller extent forest fires and in connection with oil pollution. There are various remediation methods which have been employed in the removal of environmental pollutants such as chemical, thermal and biological treatments.

The aims of our researches were to synthesize potato and corn starch derivatives by alkylation reaction using ether (propylene oxide) or ester (succinic anhydride) alkyl agents in order to fulfil two main objectives: firstly to increase the aqueous solubility of modified starch and secondly to allow benzo[a]pyrene (BaP) solubilization permitting therefore its retention in polysaccharide based materials.

Indeed, BaP, a high molecular weight polycyclic aromatic hydrocarbon, is a toxic, carcinogenic and mutagenic compound which tends to persist in the environment because of its very low water solubility and its tendency to be strongly absorbed on soil organic matter. Such chemical modifications of starches have been used to introduce new properties permitting their use as potential surfactant agent for enhancing BaP bioavailability for microorganisms, such as fungi. These researches extend starches applications as renewable for soil rehabilitation.

Keywords: *agro-industrial wastes, polycyclic aromatic hydrocarbon, polysaccharide chemical modified.*