# ENVIRONMENTALLY FRIENDLY BINDERS FROM WOOD FOR DUST SUPPRESSION

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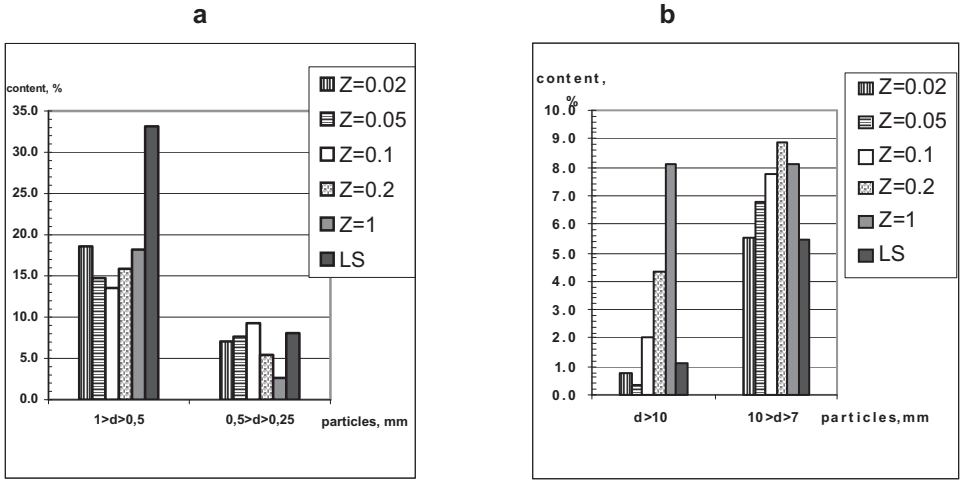
Dust suppression is an important widespread problem for people and animals, who live close to unsealed roads, mining, thermal power plants, eroded soil areas, etc. The dust produced by these objects has a lot of the negative effects on environment, including contamination of air and water, which causing health problems for earth inhabitants. When a surface of a dust-laden object dries out, the adhesiveness between its particles is reduced. The fine particles blows away and give rise to dust. For the dust suppression, chemical suppressants are used. They are adsorbed by the dusty ground surface forming the glued composite aggregates, which resist the generation of dust and reduces erosion and wear of the surface. The best result is achieved when ground aggregates in the upper layer have an optimal fractional composition that is characterized by the enhancing content of large aggregates. The use of wood polymer such as lignin is of great scientific and practical interest for obtaining of chemical suppressants, because the lignin-based suppressants are the low-cost, environmentally friendly and biodegradable compounds [1,2]. The aim of this work is a study of the effect of a composition of the modified sulphite lignin (MLS) and its rheological properties on a fractional composition of dusty sandy ground. MLS represents a lignin-polymer complex [3], in which the polymer/lignin ratio (Z) is changed in a wide range. It is found that the amount of large and medium air-dry aggregates increases, but the MLS content decreases with the growth in its maximum Newtonian viscosity due to enhancing the content of the polymer modifier.




Content of small (a) and large aggregates (b) in the structured dusty ground treated with water solutions of MLS of different composition and non-modified LS

At the same time the water resistance of the formed aggregates depends on the structural viscosity of MLS solutions and increases with the reinforcement of the polymeric fluctuation entanglement network. The obtained dependencies are obviously governed by both the peculiarities of the supramolecular structure of MLS in aqueous solutions, and the coagulation-condensation character of the formation of the artificial soil aggregates.

References:

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