APPLICATION OF HYDROLYSIS PRODUCTS IN THE PRODUCTION OF ORGANIC BINDERS

Makhammatov Muzaffar Safarovich
lecturer of the department
"Technology of production of building materials, products and structures"
Samarkand State University of Architecture and Construction named after Mirzo Ulugbek

Annotation: *With increasing volumes of road construction, it is necessary to expand the range of organic binders, which provide a significant economic effect through the use of cheap raw materials, improving working conditions, and in some cases, even for the use of local stone materials instead of crushed ones.*
Keywords: *lignin, cracking, natural polymer, hydrolysis production, coal tar, tar.*

With increasing volumes of road construction, it is necessary to expand the nomenclature of organic binders. The use of lignin provides a significant economic effect due to the use of cheap raw materials, increasing the service life of coatings, as well as improving working conditions.

Lignin is a mixture of aromatic natural polymers of a related structure that are part of the cellular structure of most terrestrial plants, including trees.

Lignin is the main structural component responsible for binding plant cells to each other, so lignin can be used to make adhesives and surface coatings.

Large quantities of lignin are produced all over the world, which is a by-product of the processing of wood material in the production of paper on an industrial scale.

Lignin is one of the most mechanically and chemically resistant natural polymers and has very interesting properties.

Hydrolytic lignin, as well as shale resins, liquid tar and other products of thermal processing of oil shale, oil and tar are used for the production of lignin binders. At temperatures of 400 ...600 0C, it decays to form resin, liquid and gaseous products. Lignin has the ability to transition into a viscous plastic state, is rich in nitrogen (0.5 kg of free nitrogen per ton).

The standard of lignin formation is 0.3-0.4 t/t of hydrolysis production.

The lignin binder consists of two components: a liquid hydrocarbon fraction and a cracking product of hydrolyzed lignin in a liquid hydrocarbon fraction. Thermal decomposition of lignin is produced at a certain ratio between the components at temperatures up to 305-320 ^{0}C.

The technology of lignin binder includes the following operations: dehydration of a part of coal tar (25-30%) in a special boiler when heated to 240 ^{0}C; resin supply to the reactor, heating it to 300-310 ^{0}C; loading lignin into the reactor and heating the mixture to 310 ^{0}C while stirring; cracking lignin at 310-320 ^{0}C for 1 hour; product dispersion cracking by pumping with a pump for 15-20 minutes; feeding the rest of the coal tar heated to 90-110 ^{0}C into the reactor and mixing it with the cracking product; pumping the binder into the boiler and mixing it with condensate collected during resin heating and lignin cracking.

There are three main types of road materials that can be used to produce lignin in road construction: asphalt, asphalt concrete mix and roadbed soil. In asphalt, lignin can be used as a modifier, filler, emulsifier, antioxidant and binder. In asphalt concrete mixtures, lignin can be used as an additive. In the soils of the road base, lignin can be used as a soil stabilizer. In addition, the article analyzes the effects of the use of lignin based on the life cycle assessment. The findings show that asphalt modified with lignin has a higher viscosity and hardness, and its resistance to high temperatures and ruts can be significantly improved compared to conventional asphalt.

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 12 Issue: 04 in April-2023
https://www.gejournal.net/index.php/IJSSIR

Conclusion. Some asphalt concrete binders modified with lignin have reduced cracking resistance at low temperatures and fatigue resistance, which can be adjusted and selected in accordance with climate change in different regions. The effectiveness of lignin as an additive to asphalt concrete mixture and asphalt filler has been proven. Lignin can also provide good mechanical properties as well as environmental benefits as a soil stabilizer. In general, lignin plays an important role in asphalt concrete pavements and the ground of the roadway, and probably in the future it will become a development trend due to its environmental friendliness and low cost.

Used literature:

1. Ryzhenkov A.V. Chemical technology of lignin and promising materials based on it // Online journal "Science Studies". 2015. Vol. 7, No. 6
2. Osipova L.V. The use of plant products as raw materials for the production of organic products and polymer materials // Chemical industry abroad. 1989.
3. Bajva, D. S., Purkhashem, G., Ulla, A. H. and Bajva, S. G. (2019). A brief overview of current lignin production, applications, products and their environmental impact

ISSN 2277-3630 (online), Published by International journal of Social Sciences & Interdisciplinary Research., under Volume: 12 Issue: 04 in April-2023
https://www.gejournal.net/index.php/IJSSIR