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METHOD FOR OBTAINING ADDITIVES FROM WASTE POLYMERIC MATERIALS FOR BITUMEN

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Annotation
The basic purpose of bitumen of a mineral powder as be completed of bitumen is to translate volumetric bitumen in a film status. In such status the viscosity and durability of bitumen raises. The important value has that circumstance, that the application of the activated polymeric powders essentially reduces the charge of bitumen and completed.

Keywords: varnishcolourful, bitumen, asphaltconcrete, mineral powder mixed knitting, way of reception, knitting, activity, self a powder, increase of a subtlety.

Introduction

Mineral powder, which is a polydisperse material, is the most important structure-forming component of asphalt concrete. It accounts for up to 90-95% of the total surface of mineral grains that make up asphalt concrete. The main purpose of mineral powder bitumen as a bitumen filler is to convert bulk bitumen into a film state. In this state, the viscosity and strength of bitumen increase. Together with bitumen, mineral powder forms a structured dispersed system, which acts as a binder in asphalt concrete.

It has been established that at a certain ratio of bitumen-mineral powder, the highest strength of the structured disperse system formed by these materials is achieved. At a certain concentration of mineral powder, the thickness of bituminous layers on the surface of mineral particles sharply decreases, which leads to a high degree of bitumen structuring, and, consequently, to strengthening of contacts between grains [1-7].

The interaction of mineral powder with bitumen is determined by physical and mechanical processes occurring at the bitumen-stone material boundary, due to which a thin bitumen film is formed on the surface of mineral particles, not only enveloping them, but also firmly adhered to them.

The bonds that occur between bitumen and the surface of mineral particles are of paramount importance for the properties of asphalt concrete. Therefore, the most important characteristic of a mineral powder is its ability to adhere strongly to binders. The strength of adhesion to bitumen is influenced by the chemical and mineralogical composition of the mineral powder,

as well as the properties of bitumen. The best adhesion with bitumen is given, in addition to carbonate and basic rocks, and polymer additives [11-17].
One of the most promising ways to improve the quality of asphalt concrete is the introduction of polymer additives into its composition or into the bitumen used, which improve the structural and mechanical properties of these materials. Recently, in connection with the development of the chemical industry, research has been intensively developed both in Uzbekistan and abroad, related to the use of a wide range of polymers in bitumen and asphalt concrete [8-11].
A necessary condition for the effective influence of any polymer on the properties of bitumen is the compatibility of these components. This is primarily determined by the ability of the polymer to dissolve or swell in bitumen. Only under this condition can a significant improvement in the structure and properties of bitumen be obtained.
Various methods have been developed for introducing polymers into bitumen and asphalt mixtures. The main ones are: the introduction of a powdered polymer into bitumen heated to a high temperature (150-1700C); introduction of a polymer solution (in various hydrocarbon fractions) into heated bitumen (bitumen temperature in this case depends on the type of solvent); introducing the powdered polymer directly into the heated mineral material before it is combined with the bitumen [17-26].

Fig.1. General view of the manufactured bitumen.

From the group of rubber-like polymers (elastomers), in addition to the mentioned natural rubber and rubber powder, the most studied are styrene-butadiene and chloroprene rubbers, as well as various waste products from the production of synthetic rubbers.
Polymers are also used in the form of latsecs. The latter can be effectively introduced into the bitumen emulsion. Less commonly, the polymer is introduced in the form of latsec into hot bitumen. At the present time, a method has been developed for introducing a polymer into an asphalt concrete mixture by means of its mechano-chemical grafting to freshly formed surfaces of mineral grains.
A number of our works are devoted to the combination of bitumen, and more often coal tar, with epoxy resins. Recently, a bitumen-polymer binder (and the conditions for its use in asphalt

concrete) obtained by combining bitumen with polymeric waste paints and varnishes (divinylstyrene thermoplastic elastomer) has been studied in detail.

An effective way to improve the quality of road bitumen is to regulate their properties by using various modifying additives (polymers, crumb rubber, sulfur, adhesive additives, etc.). The use of polymers for modifying bitumen is one of the most actively implemented technologies for the construction and repair of road surfaces.

After the processing of industrial polymer waste, it can be used as a polymer to obtain modified bitumen and improve the quality of road bitumen [14-26].

The method of introducing the polymer into the asphalt concrete mixture by its mechano-x

Table -1The method of introducing a polymer into an asphalt concrete mixture by its mechano-chemical grafting to freshly formed surfaces of mineral grains.

Sample No. Density, g/cm^3 Swelling, vol.% Water saturation by volume, % Crushing strength, Pa x 105 at temp. pax °C Water resistance coefficients	Sample No. Density, g/cm^3 Swelling, vol.% Water saturation by volume, % Crushing strength, Pa x 105 at temp. pax °C Water resistance coefficients	Sample No. Density, g/cm^3 Swelling, vol.% Water saturation by volume, % Crushing strength, Pa x 105 at temp. pax °C Water resistance coefficients	Sample No. Density, g/cm^3 Swelling, vol.% Water saturation by volume, % Crushing strength, Pa x 105 at temp. pax °C Water resistance coefficients	Sample No. Density, g/cm^3 Swelling, vol.% Water saturation by volume, % Crushing strength, Pa x 105 at temp. pax °C Water resistance coefficients		Sample No. Density,	
				R_{20}	R_{50}	Kv at 1-day Kvdl 14/30 at	Kv at 1-day Kvdl 14/30 at
						water	
0*	2,30	0,43	5,30	26,2	10,6	0,76	0,67/-
1	2,33	0,45	6,11	29,9	11,8	0,88	0,74/-
2	2,37	0,59	3,83	36,0	13,4	1,15	0,96/0,62
3	2,34	0,14	4,70	37,6	16,2	1,14	0,97/0,91
4	2,39	0,32	2,71	33,1	11,2	0,89	0,75/-
5	2,36	0,13	4,07	34,2	12,8	0,90	0,82/-

* - mixture on the original bitumen;

Nos. 1-5 - mixtures based on hydrolytic lignin modified with chemical waste and sulfur-containing petrochemical wastes:

Of particular importance is the activation of mineral powders and polymer additives used in bitumen-mineral mixtures used for lightweight coatings. The difference between such mixtures from high-quality asphalt concrete is often associated only with the quality of the mineral powders and additives used. Meanwhile, as a result of physical and mechanical treatment, the properties of a number of materials that are considered unsuitable for asphalt concrete can be significantly improved.

Every year, in the automotive industry of the Republic of Uzbekistan, a lot of polymeric toxic waste is generated during the painting of a car and its parts. For example, at the SamAvto and MAN automobile plants, as well as at the Samarkand refrigeration plant, more than 230 tons of polymeric toxic waste are accumulated per year. In GM Uzbekistan, this figure is more than

800 tons. The increase in the volume of polymer toxic waste creates problems for the environment and the atmosphere.

One of the most important conditions for increasing the durability of asphalt concrete pavements is to improve the properties of bitumens and their correct choice, taking into account operation. However, the deepening of oil refining in order to increase the output of fuel and oil components leads to a deterioration in the quality of bitumen.At present, road bitumen grades BND and BN do not meet the requirements of road construction in terms of heat resistance, low-temperature crack resistance, adhesive properties, especially the surface of mineral materials from acid rocks, resistance to aging.

The use of polymer powder significantly improves the performance of the technological process for the preparation of asphalt concrete mixtures; the temperature of the discharged mixture is reduced, the quality is improved and the duration of mixing is reduced, the ease of processing of the mixture during laying and compaction is increased.

It is also important that the use of activated polymer powders significantly reduces the consumption of bitumen and aggregates [20-26].

With the use of polymer additives increases:

. Efficiency of pavements for at least 3 years;

. The physical and mechanical indicators of the quality of asphalt concrete increase;

. The cost of repair and maintenance of roads is reduced;

. The quality of road bitumen is improved, including softening temperature, needle penetration depth (penetration), extensibility and fully meets the requirements of the GOST 22245-90 regulatory document;

. The impact of industrial waste on the environment is reduced;

. Obtaining road mastic for dry, hot, sharply continental climate;

. Obtaining modified bitumen for dry, hot, sharply continental climate;

In the small enterprise "LABSTROY" from the "Testing Laboratory for Construction Products" at the Fergana Polytechnic Institute, mineral additives from polymer waste for asphalt concrete plants (APC) have been studied and produced for this purpose.

Conclusion

Road surfaces built in various parts of the Fergana region with the use of a polymer additive have high performance. The use of a polymer additive in sandy asphalt concrete is especially effective, since in this case it is possible to obtain coatings with high friction properties without the use of fractionated crushed stone for this purpose.

Literature

1. Абобакирова, З., & Мирзаева, З. (2022). ПЕРСПЕКТИВНОСТЬ ПОВЫШЕНИЯ ЭНЕРГОЭФФЕКТИВНОСТИ ЗДАНИЙ В УЗБЕКИСТАНЕ.
2. Абобакирова, З. А., & Бобофозилов, О. (2022, May). ИСПОЛЗОВАНИЕ ШЛАКОВЫХ ВЯЖУЩИХ В КОНСТРУКЦИОННЫХ СОЛЕСТОЙКИХ БЕТОНАХ. In *INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING* (Vol. 1, No. 6).

3. Гончарова, Н. И., & Абобакирова, З. А. (2022, April). БИТУМИНИРОВАННЫЙ БЕТОН ДЛЯ ПОДЗЕМНЫХ КОНСТРУКЦИЙ ЗДАНИЙ. In *INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING* (Vol. 1, No. 6, pp. 122-125).
4. Абобакирова, З. А., & кизи Мирзаева, З. А. (2022, April). СЕЙСМИК ҲУДУДЛАРДА БИНОЛАРНИ ЭКСПЛУАТАЦИЯ ҚИЛИШНИНГ ЎЗИГА ХОС ХУСУСИЯТЛАРИ. In *INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING* (Vol. 1, No. 6, pp. 147-151).
5. Абобакирова, З. А., & угли Содиков, С. С. (2022, April). СВОЙСТВА ЦЕМЕНТНОГО КАМНЯ ОПТИМАЛЬНОГО СОСТАВА С ДОБАВКАМИ В УСЛОВИЯХ СУХОГО ЖАРКОГО КЛИМАТА. In *INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING* (Vol. 1, No. 6, pp. 81-85).
6. Абобакирова, З. А. (2022). кизи Мирзаева ЗА СЕЙСМИК ҲУДУДЛАРДА БИНОЛАРНИ ЭКСПЛУАТАЦИЯ ҚИЛИШНИНГ ЎЗИГА ХОС ХУСУСИЯТЛАРИ. In *INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING* (Vol. 1, No. 6, pp. 147-151).
7. Абобакирова, З. А., & угли Содиков, С. С. (2022, April). СВОЙСТВА ЦЕМЕНТНОГО КАМНЯ ОПТИМАЛЬНОГО СОСТАВА С ДОБАВКАМИ В УСЛОВИЯХ СУХОГО ЖАРКОГО КЛИМАТА. In *INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING* (Vol. 1, No. 6, pp. 81-85).
8. Abobakirova, Z. A. (2021). Reasonable design of cement compositionfor refactory concrete. *Asian Journal of Multidimensional Research*, *10*(9), 556-563.
9. Asrorovna, A. Z. (2021). Effects Of A Dry Hot Climate And Salt Aggression On The Permeability Of Concrete. *The American Journal of Engineering and Technology*, *3*(06), 6-10.
10. Abobakirova, Z. A. (2021). Regulation Of The Resistance Of Cement Concrete With Polymer Additive And Activated Liquid Medium. *The American Journal of Applied sciences*, *3*(04), 172-177.
11. Goncharova, N. I., & Abobakirova, Z. A. (2021). Reception mixed knitting with microadditive and gelpolimer the additive. *Scientific-technical journal*, *4*(2), 87-91.
12. Abdugofurovich, U. S., & Asrorovna, A. Z. (2022). STRESS-STRAIN STATE OF THIN-WALL SPATIAL COATINGS UNDER VARIOUS DESIGN SOLUTIONS OF CONTOUR STRUCTURES AND SHELL PLATES. Spectrum Journal of Innovation, Reforms and Development, 8, 332-335.
13. Asrorovna, A. Z., Abdugofurovich, U. S., & Mirzaakbarovna, M. S. (2022). INVESTIGATION OF THE STRENGTH AND DUTNESS OF REINFORCED CONCRETE BEAMS WITH GLASS COMPOSITE REINFORCEMENTS. Spectrum Journal of Innovation, Reforms and Development, 8, 310-316.
14. Abdugofurovich, U. S., & Mirzaakbarovna, M. S. (2022). COMBINED COMPOSITE REINFORCED CONCRETE BEAMS. Spectrum Journal of Innovation, Reforms and Development, 8, 317-324.
15. Asrorovna, A. Z., Abdug‘ofurovich, U. S., & Sodiqjon o‘g‘li, S. F. (2022). ISSUES OF IMPROVING THE ECONOMY OF BUILDING MATERIAL-WOOD PRODUCTION. Spectrum Journal of Innovation, Reforms and Development, 8, 336-340.

16. Asrorovna, A. Z., Abdugofurovich, U. S., & Mirzaakbarovna, M. S. (2022). OPTIMIZATION OF CORROSION-RESISTANT CONCRETE WITH CHEMICAL ADDITIVES. Spectrum Journal of Innovation, Reforms and Development, 8, 296-303.
17. Abdugofurovich, U. S. (2022). BONDING OF POLYMER COMPOSITE REINFORCEMENT WITH CEMENT CONCRETE. Gospodarka i Innowacje., 24, 457-464.
18. Умаров, Ш. А., & ўғли Холмирзаев, Қ. Р. (2022, April). ШИША ТОЛАЛИ АРМАТУРАЛАРНИ ТЎСИНЛАРДА ҚЎЛЛАШ ОРҚАЛИ МУСТАҲКАМЛИК ВА БУЗИЛИШ ҲОЛАТЛАРИ АНИҚЛАШ. In INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING (Vol. 1, No. 6, pp. 135-141).
19. Abdug‘Ofurovich, U. S., O‘G‘Li, S. F. S., & O‘G‘Li, E. A. A. (2022). KOMPOZIT ARMATURALI EGILUVCHI BETON ELEMENTLARNING KUCHLANIB-DEFORMATSIYALANGANLIK HOLATINI EKSPERIMENTAL TADQIQ ETISH. Talqin va tadqiqotlar ilmiy-uslubiy jurnali, 4(4), 41-46.
20. Абдуллаев, И. Н., Умаров, Ш. А., Саримсакова, Н. Р., & Усмонов, Э. Б. У. (2022). ИССЛЕДОВАНИЕ МЕТОДОВ КОНТРОЛЯ И ОБЕСПЕЧЕНИЯ КАЧЕСТВА РАБОТ НА КОМПЛЕКСНОМ ПРОЦЕССЕ УСТРОЙСТВА КОНСТРУКЦИЙ ИЗ МОНОЛИТНОГО ЖЕЛЕЗОБЕТОНА. Scientific progress, 3(1), 766-770.
21. Абдуллаев, И. Н., Умирзаков, З. А., & Умаров, Ш. А. (2021). Анализ Тканей В Фильтрах Систем Пылегазоочистки Цементного Производства. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 1(6), 16-22.
22. Умаров, Ш. А. (2021). Исследование Деформационного Состояния Композиционных Арматурных Балок. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 1(6), 60-64.
23. Umarov, S. A. (2021). Development of deformations in the reinforcement of beams with composite reinforcement. Asian Journal of Multidimensional Research, 10(9), 511-517.
24. Shavkatovich, N. K. (2022). SYSTEMS OF ARTIFICIAL REGULATION OF THE AIR ENVIRONMENT OF APARTMENTS AND HOUSES. *Spectrum Journal of Innovation, Reforms and Development*, *9*, 169-174.
25. Сон, Д. О., & Халимов, А. О. (2021). УПРАВЛЕНИЕ МЕТРОЛОГИЧЕСКИМИ РИСКАМИ КАК ОСНОВА ДЛЯ УВЕЛИЧЕНИЯ КАЧЕСТВА ПРОДУКЦИИ. *Экономика и социум*, (2-2), 202-210.
26. угли Ахмадалиев, А. Х., & угли Халимов, А. О. (2022, May). КОМПОЗИТНОЕ УСИЛЕНИЕ ИЗГИБАЮЩИЙ БАЛК ПОД НАГРУЗКОЙ. In *INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING* (Vol. 1, No. 7, pp. 409-415).
27. Urmonjonovich, A. A. (2022). APPLICATION OF FACTORS TO INCREASE THE DURABILITY OF MODIFIED ASPHALT CONCRETE. *Spectrum Journal of Innovation, Reforms and Development*, *9*, 196-200.
28. Ахмадалиев, А. Х., & Мирзабабаева, С. М. (2022). КОМПОЗИТ АРМАТУРАЛИ ЭГИЛУВЧИ ТЎСИНЛАРНИНГ ЮК ОСТИДА КУЧЛАНИБ ДЕФОРМАТЦИЯЛАНИШИ. *Eurasian Journal of Academic Research*, *2*(6), 416-423.

29. Hasanboy o'g'li, A. A. (2022). CONSTRUCTION OF DOMES OF ARCHITECTURAL MONUMENTS IMPROVING SOLUTIONS. *Spectrum Journal of Innovation, Reforms and Development*, *9*, 236-239.
30. Бахромов, М. М. (2020). Исследование сил негативного трения оттаивающих грунтов в полевых условиях. *Молодой ученый*, (38), 24-34.
31. Бахромов, М. М. (2022). МЕХАНИЧЕСКИЕ ХАРАКТЕРИСТИКИ ГРУНТА И ПОГНОЗ ЗАКОНОМЕРНОСТИ ВОЗДЕЙСТВИЯ СИЛ НЕГАТИВНОГО ТРЕНИЯ ПО БОКОВОЙ ПОВЕРХНОСТИ СВАИ. *PEDAGOGS jurnali*, *10*(3), 162-167.
32. Бахромов, М. М., & Рахмонов, У. Ж. (2019). Дефекты при проектировании и строительстве оснований и фундаментов. *Проблемы современной науки и образования*, (3 (136)), 76-79.
33. Sultanboevich, T. N. (2020). Development Of Spatial Metal Wooden Bar Constructions Of Coatings, From Composition Wooden Elements. *The American Journal of Applied sciences*, *2*(12), 113-121.
34. Sultonboevich, T. N. (2022). STUDY OF PHYSICAL-MECHANICAL PROPERTIES OF POPLAR WOOD USING HOT STEAM. *Spectrum Journal of Innovation, Reforms and Development*, *9*, 175-181.
35. Mirzaakbarovna, M. S., & Sultanbayevich, T. N. (2021). Wood Processing For Construction. *The American Journal of Applied sciences*, *3*(05), 186-189.
36. Davlyatov, S. M., & Kimsanov, B. I. U. (2021). Prospects For Application Of Non-Metal Composite Valves As Working Without Stress In Compressed Elements. *The American Journal of Interdisciplinary Innovations Research*, *3*(09), 16-23.
37. Akhrarovich, A. K., & Muratovich, D. S. (2022). CONSTRUCTION FEATURES OF PERFORMING EXTERNAL REINFORCEMENT FROM COMPOSITE MATERIALS. *Spectrum Journal of Innovation, Reforms and Development*, *9*, 110-115.
38. Akhrarovich, A. K., & Muratovich, D. S. (2022). APPLICATION AND CLASSIFICATION OF COMPOSITE REINFORCEMENT IN CONSTRUCTION. *Spectrum Journal of Innovation, Reforms and Development*, *9*, 95-100.
39. Давлятов, Ш. М. (2022). Технологическая поврежденность бетонов и ее влияние на эксплуатационную долговечность бетона. *Научно-технический журнал ФерПИ*.
40. Fathulloev A.M., Eshev S.S., Samiev L.N., Ahmedov I.G'., Jumaboyev X., Arifjanov S. Boglanmagan gruntlardan tashkil topgan uzanlarda yuvilmaslik tezliklarini aniklash [To the determination of non-effective speed in the beds containing from unconnected soils] //Journal "Irrigatsiya va melioratsiya". Tashkent. – 2019. – C. 27-32.
41. Arifjanov A., Akmalov Sh., Akhmedov I., Atakulov D. Evaluation of deformation procedure in waterbed of rivers //IOP Conference Series: Earth and Environmental Science. – IOP Publishing, 2019. – T. 403. – №. 1. – C. 012155.
42. Arifjanov A., Samiyev L., Akhmedov I., Atakulov D. Innovative Technologies In The Assessment Of Accumulation And Erosion Processes In The Channels //Turkish Journal of Computer and Mathematics Education (TURCOMAT). – 2021. – T. 12. – №. 4. – Pp. 110-114.
43. Axmedov I.G'., Muxitdinov M., Umarov I., Ibragimova Z. Assessment of the effect of sedibles from sokhsoy river to kokand hydroelectric power station //InterConf. – 2020.
44. Arifjanov A.M., Ibragimova Z.I., Axmedov I.G'. Analysis Of Natural Field Research In The Assessment Of Processes In The Foothills The American Journal of Applied sciences. – 2020. – T. 2. – №. 09. – Pp. 293-298.