



**ФАН ВА ТЕХНОЛОГИЯЛАР  
ТАРАҚҚИЁТИ**  
**РАЗВИТИЕ НАУКИ И  
ТЕХНОЛОГИЙ**

**5  
2025**

**Таҳририят ҳайъати раиси:**

**СИДДИҚОВА С.Ғ. –**

**Бухоро давлат техника университети ректори**

**Муовини:**

**НИЗАМОВ А.Б. –**

**БухДТУ илмий ишлар ва инновациялар бўйича проректори**

**Таҳрир ҳайъати:**

**МУҚИМОВ К.М. –** ЎзР ФА академиги (ЎЗМУ)

**ЖАЛИЛОВ А.Т. –** ЎзР ФА академиги (Тошкент кимё-технология ИТИ)

**НЕГМАТОВ С.Н. –** ЎзР ФА академиги (“Фан ва тараққиёт” ДУК)

**БАХОДИРОВ Ғ.А. –** т.ф.д., профессор, ЎзР ФА бош илмий котиби

**ХАМИДОВ О.Х. –** иқтисод фанлари доктори, профессор (БухДУ)

**ЖАЛИЛОВ Т.К. –** иқтисод фанлари доктори (DSc), профессор (ТКТИ)

**ПАРДАЕВА М.Д. –** БухДТУ ёшлар масалалари ва маънавий-маърифий ишлар бўйича биринчи проректори, фалсафа фанлари доктори (DSc)

**ХОЖИЕВ А.Х. –** ўқув ишлари бўйича проректор, техника ф.ф.д. (PhD)

**САИДОВ С.Б. –** Бухоро ДТУ молия ва иқтисод ишлари бўйича проректори

**ҚУРБОНОВ Ж.М. –** техника фанлари доктори, профессор (Самарқанд ИСИ)

**АДИЗОВ Б.З. –** техника фанлари доктори (DSc), профессор, ЎзРФА УНКИ

**АСТАНОВ С.Х. –** физика-математика фанлари доктори, профессор

**РАХМОНОВ Х.Қ. –** техника фанлари доктори, профессор

**ВОХИДОВ М.М. –** техника фанлари доктори, профессор

**ЖЎРАЕВ Х.Ф. –** техника фанлари доктори, профессор

**САДУЛЛАЕВ Н.Н. –** техника фанлари доктори (DSc), профессор

**МАЖИДОВ Қ.Х. –** техника фанлари доктори, профессор

**ФОЗИЛОВ С.Ф. –** техника фанлари доктори, профессор

**ИСАБАЕВ И.Б. –** техника фанлари доктори, профессор

**АБДУРАХМОНОВ О.Р. –** техника фанлари доктори, профессор

**ГАФУРОВ К.Х. –** техника фанлари доктори (DSc), профессор

**ХАЙДАРОВ А.А. –** техника фанлари доктори (DSc), доцент

**ЖЎРАЕВ Ф.Ў. –** техника фанлари доктори (DSc), профессор

**МУРАДОВА Ф.Р. –** педагогика фанлари доктори (DSc), профессор

**ЖУМАЕВ М.Р. –** физика-математика фанлари доктори (DSc), профессор

**ЮНУСОВА Г.С. –** фалсафа фанлари доктори (DSc), профессор

**БОБОЕВ А.Ч. –** иқтисодиёт фанлари номзоди, профессор

**ТЎХТАЕВА З.Ш. –** техника фанлари доктори (DSc), профессор

**МАХМУДОВ М.Ж. –** техника фанлари доктори (DSc), профессор

**ҲАЙИТОВ Р.Р. –** техника фанлари доктори (DSc), профессор

**БОЗОРОВ Ғ.Р. –** техника фанлари доктори (DSc), профессор

**БОЛТАЕВ З.И. –** физика-математика фанлари доктори (DSc), профессор

**ОЛТИЕВ А.Т. –** техника фанлари доктори, (DSc)

**ЖАЛИЛОВ Р.Б. –** техника фанлари доктори (DSc), профессор

**МАХМУДОВ М.И. –** техника фанлари доктори (DSc), профессор

**МАЖИДОВА Н.Қ. –** техника фанлари доктори (DSc), профессор

**АХМЕДОВ В.Н. –** техника фанлари доктори (DSc), профессор

**МАХМУДОВ Р.А. –** техника фанлари доктори (DSc), профессор

**ПУЛАТОВА М.И. –** физика-математика фанлари номзоди, профессор

**РАҲМАТОВ Ш.А. –** педагогика фанлари бўйича фалсафа доктори (PhD)

**ОЧИЛОВ А.Р. –** техника фанлари доктори (DSc), доцент

**ЎРИНОВ У.А. –** педагогика фанлари доктори (DSc), профессор

**ПЎЛАТОВА С.У. –** техника фанлари доктори (DSc), профессор

**САМИЕВА Ш.Х. –** педагогика фанлари доктори (DSc), профессор

**ТЕШАЕВ М.Х. –** физика-математика фанлари доктори (DSc), профессор

**ХАЙТОВ В.У. –** иқтисодиёт фанлари доктори (DSc), доцент

**ХОЖИЕВ Ш.М. –** техника фанлари доктори (DSc), доцент

**ХАЙИТОВ Ш.Н. –** иқтисодиёт фанлари доктори (DSc), доцент

**ЗОИРОВ Э.Х. –** фалсафа фанлари доктори (DSc), доцент

**НАРЗИЕВ М.С. –** техника фанлари доктори (DSc), доцент

**НАМАЗОВА Н.Дж. –** иқтисодиёт фанлари б.ф.д. (PhD), доцент

**Бош муҳаррир:** ДЎСТОВ Х.Б. – кимё фанлари доктори, профессор

**Муҳаррирлар:** Артикова М.М., Истамова Г.Х.

**Мусахҳиҳ:** Баракаева Д.Ф.

## **ФАН ВА ТЕХНОЛОГИЯЛАР ТАРАҚҚИЁТИ**

**ИЛМИЙ – ТЕХНИКАВИЙ ЖУРНАЛ**

## **РАЗВИТИЕ НАУКИ И ТЕХНОЛОГИЙ**

**НАУЧНО – ТЕХНИЧЕСКИЙ ЖУРНАЛ**

*Журнал Ўзбекистон матбуот ва ахборот агентлиги Бухоро вилояти бошқармасида 2014 йил 22-сентябрда № 05-066-сонли гувоҳнома билан рўйхатга олинган*

**Муассис:**

**Бухоро давлат техника университети**

*Журнал Ўзбекистон Республикаси Вазирлар Маҳкамаси ҳузуридаги ОАК Раёсатининг 2017 йил 29-мартдаги №239/5-сонли қарори билан диссертациялар асосий илмий натижаларини чоп этиш тавсия этилган илмий наشرлар рўйхатида киритилган. 2019 йилда Ўзбекистон Республикаси ОАК Раёсатининг қарорлари билан қайта рўйхатдан ўтказилган.*

**Таҳририят манзили:**

**200100, Бухоро шаҳри, Қ. Муртазоев кўчаси, 15-уй, Бухоро давлат техника университети**

**Тел: 0(365) 223-92-40**

**Факс: 0(365) 223-78-84**

**Электрон манзил:**

**E-mail: [fantt\\_jurnal@umail.uz](mailto:fantt_jurnal@umail.uz)**

**Журналнинг тўлиқ электрон варианты билан**

**<https://journal.bmti.uz/>**

**сайти орқали танишиш мумкин.**

*Ушбу журналда чоп этилган материаллар таҳририятнинг ёзма рухсатисиз тўлиқ ёки қисман чоп этилиши мумкин эмас. Таҳририятнинг фикри муаллифлар фикри билан ҳар доим ҳам мос тушмаслиги мумкин. Журналда ёритилган материалларнинг ҳаққонийлиги учун мақолаларнинг муаллифлари ва реклама берувчилар масъулдирлар.*

# МУНДАРИЖА - СОДЕРЖАНИЕ – CONTENT

| ТЕХНИКА, ТЕХНОЛОГИЯ ВА ЖИҲОЗЛАР                                                                                                                                                                                                                                           |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Juraev D.D.</b> Methodology for calculating the angular vibrations of blades on a separator machine rotor and developing its mathematical model. ....                                                                                                                  | <b>4</b>   |
| <b>Maxmudov B.M., Abdulxayev A.A.</b> Comparative analysis of solar collectors for drying systems .....                                                                                                                                                                   | <b>8</b>   |
| <b>Бибутов Н.С., Хамраев Х.Х., Самадова Н., Бакаева Ш.</b> Основные требования к расчету деталей машин .....                                                                                                                                                              | <b>16</b>  |
| <b>Жураев Д.Д.</b> Эффективность конструкции конусного двухбарабанного сепараторной машины .....                                                                                                                                                                          | <b>22</b>  |
| <b>Tog‘aymurodov S.Z.</b> Transformatorlarning ishlash jarayonida temperatura xarakteristika-larining tahlili .....                                                                                                                                                       | <b>26</b>  |
| <b>Muminov R.O., Tuxtaev B.I., Turabov X.Sh., Kushimov F.</b> Skvajinalarga o‘rnatilgan ankerlarning kinematik parametrlarini hisoblashning ilmiy asoslari. ....                                                                                                          | <b>30</b>  |
| <b>Jo‘rayev F.O‘., Saidova G.K.</b> pushta olgichli universal qurilma parametrlarining uning ish ko‘rsatkichlariga ta’siri. ....                                                                                                                                          | <b>35</b>  |
| <b>Хабибов Ф.Ю., Рамазонов А.Ч., Ахмедов Ю., Юсупов Ф.Ф.</b> Конструирование поверхностей методом геометрических преобразований .....                                                                                                                                     | <b>40</b>  |
| <b>Бозаров О.О., Мирзаев С.З.</b> Контрроторный гидроагрегат с реактивным и активным рабочими колесами .....                                                                                                                                                              | <b>44</b>  |
| <b>Kayumov U.E., Djurayev R.U., Pardayeva Sh.S.</b> Yuqori changalangan muhitda ishlovchi kar- yer avtosamosvallarining ichki yonuv dvigatellariga chang zarrachalarining ta’sirini tadqiq etish                                                                          | <b>54</b>  |
| КИМЁ ВА КИМЁВИЙ ТЕХНОЛОГИЯЛАР                                                                                                                                                                                                                                             |            |
| <b>Хакимов А.А., Исомидинов А.С.</b> Преслаш динамикасининг мустахкамликка таъсирини тадқиқ этиш .....                                                                                                                                                                    | <b>61</b>  |
| <b>Адолатова Ш.Ж, Фозилов С.Ф, Фозилов Ҳ.С.</b> Таркибида азот сақлаган метакрилат по- лимерларни синтез қилиш ва уларни антикоррозион присаткалар сифатида қўлланилиши .                                                                                                 | <b>66</b>  |
| <b>Mixliyev O. A., Nabiyeu A.A., Yorboboyev R.Ch., Ro‘ziyev I.X.</b> Mahalliy talk-magnezit minerali fraksiyalarining fizik-mexanik, kimyoviy va dispers tarkibini o‘rganish .....                                                                                        | <b>72</b>  |
| <b>Obitov N.M.</b> Ikkilamchi alyuminiy-magniy qotishmalarining istiqbollari .....                                                                                                                                                                                        | <b>77</b>  |
| <b>Djalilov.A.T., Karimov M.U., Ismailov F.S, Ismailova X. Dj.</b> Polikarboksilat asosidagi qo‘shimchalarning beton qorishmalariga fizik-mexanik ta’siri. ....                                                                                                           | <b>84</b>  |
| <b>Tojiyev O.O.</b> Yuqori karbonatli terrigen qatlamlarda kislotali ishlov berish uchun yaratilgan kislota kompozitsiyasini tarkibini sinash usullari .....                                                                                                              | <b>89</b>  |
| <b>Khujakulov A.F., Abdullaeva Sh.Sh.</b> Comparative analysis of the quality of raw materials and products in the production of road bitumens .....                                                                                                                      | <b>94</b>  |
| <b>Toshboyev S.O‘., Axmedov V.N., Panoyev E.R.</b> Gazlarni aminli tozalash jarayonida hosil bo‘ladigan ko‘pikka turli xildagi ko‘pik so‘ndirgichlarning ta’sir etish xossalari .....                                                                                     | <b>100</b> |
| <b>Abdulloyev H.R., Panoyev N.Sh., Safarov J.A.</b> Og‘ir geksan fraksiyalarining gaz xromato- mass-spektral tahlili .....                                                                                                                                                | <b>106</b> |
| <b>Ахмедова О.Б., Мустафоев Б.Ж., Қаяумов А.Ш.</b> Каталитик риформинг жараёни регенератор қурилмасида энергия тежамкорликка эришиш .....                                                                                                                                 | <b>111</b> |
| <b>Hojiyev A.A., Nurqulov F.N., Djalilov A.T.</b> Vermikulit va bazalt asosidagi issiqlik izolyatsion polimer kompozitsion materiallarni tadqiq etish .....                                                                                                               | <b>117</b> |
| <b>Norboyev Q.M., Eshmuradova G.B., Tirkasheva M.N., Xursandov J.M., Toshpulatov D.T., Tashpulatov X.Sh.</b> Xona haroratida ligandlar yordamida qayta cho‘ktirish usuli orqali gibridd $MA_{1-x}FA_xPbI_3$ perovskit kvant nuqtalar sintezi hamda spektral tadqiqi ..... | <b>122</b> |

|                                                                                                                                                                                                                      |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Matkarimova U.U., Qutlimurotova N.X., Raxmatullayev F.N., O'rolova Z.D., Gulyamov X., Xasanova N.X.</b> p-Br fenilsirka kislolaning elektrokimyoviy sintezi . . . . .                                             | <b>127</b> |
| <b>Egamnazarova F.D., Panjiyev U.R.</b> Sintez gazidan yengil olefin qatori uglevodorod ishlab chiqarishning asosiy parametrlariga faollashtirish bosqichidagi co bosimini ta'sirini o'rganish                       | <b>131</b> |
| <b>Egamnazarova F.D., Panjiyev U.R.</b> CO va H <sub>2</sub> aralashmasidan tanlangan katalizatorida yengil molekulyar sintetik olefin uglevodorodlarni olish jarayoni texnologiyasi. . . . .                        | <b>136</b> |
| <b>Ibragimova M.I., Amonov M.R.</b> Paxta tolasi asosidagi matolarni trietanolamin bilan aminlash va bo'yalgan matoning koloristik xossalari . . . . .                                                               | <b>141</b> |
| <b>Kadrixanov J., Urinov A.A.</b> Development of composite materials for corrosion protection of main gas and oil pipelines with increased chemical adhesion . . . . .                                               | <b>144</b> |
| <b>Рахимов Ф.Ф., Беков У.С., Сафарова Р.У.</b> Гидрофобная композиция для строительных материалов на основе гипса и ее состав . . . . .                                                                              | <b>150</b> |
| <b>Narzullayev B.A., Shirinov Sh.D., Djalilov A.T.</b> Akril kislota asosida bioparchalanvchan gidrogellar olish: suv yutish va saqlab turish shuningdek qishloq xo'jaligi hamda ekologik barqarorlikka ta'siri..... | <b>153</b> |
| <b>МАШИНАСОЗЛИК ВА ЭНЕРГЕТИКА</b>                                                                                                                                                                                    |            |
| <b>Maxmudov M.I., Timirov X.N.</b> Oqava suvlarni tozalashda aeratsiya jarayoni uchun faol loyqaning tarkibi, xususiyati va vazifasi . . . . .                                                                       | <b>161</b> |
| <b>A'zamov S.S.</b> Reducing power loss using modern methods of squirrel-cage induction motors . .                                                                                                                   | <b>165</b> |
| <b>Safarov A.B., Jo'raqulov A.X., Qo'ziyev Z.E., Qahhorov M.M.</b> Kombinatsiyalashgan quyosh-shamol energetik qurilmalarining samaradorligini oshirish bo'yicha olib borilgan ilmiy tadqiqotlar tahlili . . . . .   | <b>169</b> |
| <b>Xabibov F.Y., Murodov K.J.</b> Transport vositasi harakati mexanik energiyasini elektr energiyaga aylantirish qurilmasining simulyatsiya modeli . . . . .                                                         | <b>175</b> |
| <b>Qo'ldosheva F.S., Sharipov N.Z.</b> Uzum danagidan moy olish jarayonida yuqori chastotali tok maydonining ta'sir nazariyasi . . . . .                                                                             | <b>182</b> |
| <b>Sharipov N.Z., Gafurov K.X.</b> Gilos danagidan moy olish jarayonini o'ta yuqori chastotali tok maydonida jadallashtirish . . . . .                                                                               | <b>187</b> |
| <b>Rakhmonov I.U., Toirov M.T., Nematov L.A.</b> The influence of harmonics on the lifespan of lighting devices . . . . .                                                                                            | <b>193</b> |
| <b>ИНФОРМАТИКА ВА АХБОРОТ – КОММУНИКАЦИОН ТИЗИМЛАР</b>                                                                                                                                                               |            |
| <b>Shukrullaev J.O., Jo'raev X.F.</b> Mineral o'g'itlarni oqim harakatini tadqiq qilish jarayonining statistik modeli . . . . .                                                                                      | <b>200</b> |
| <b>Botirova N.K.</b> Ta'limiy platformalar va ulardan foydalanish imkoniyatlari . . . . .                                                                                                                            | <b>206</b> |
| <b>Samandarov I.R., Karimov S.Y.</b> C++ va OpenCV yordamida Cu–Zn qotishmasi donalarining geometrik tahlilini avtomatlashtirish . . . . .                                                                           | <b>209</b> |
| <b>ОЗИҚ-ОВҚАТ САНОАТИ ТЕХНОЛОГИЯЛАРИ</b>                                                                                                                                                                             |            |
| <b>Ergasheva X.B., Elmurodova A.S.</b> Oziq-ovqat allergiyasi va rivojlanish sabablari . . . . .                                                                                                                     | <b>215</b> |
| <b>To'ymurodova Sh.Sh., Majidov K.X., Pardayev Sh.</b> Baliqchilik uchun ozuqa yemlarining xususiy tarkibi va texnologiyasi . . . . .                                                                                | <b>220</b> |
| <b>Raxmonov Q.S., Ashurova Z.T.</b> Dorivor o'simlik xom ashyosidan olingan kukunlar yordamidaunli mahsulotlarining sifatini oshirish va va ozuqaviy qiymatini yaxshilash . . . . .                                  | <b>224</b> |
| <b>Кулиев Н.Ш., Мажидов Қ.Х.</b> Меваларда пектин микдорини аниқлаш ва уларнинг физик-химий хусусиятларини ўрганиш . . . . .                                                                                         | <b>232</b> |
| <b>Dehqonova N.A., Majidov K.X.</b> Paxta moyini rafinatsiyalash jarayonlarida zamonaviy innovatsion texnologiyalarni qo'llash va ularning matematik modelini ishlab chiqish . . . . .                               | <b>237</b> |

|                                                                                                                                                                                                                                     |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Шокиров К.А., Курбанов М.Т.</b> Анализ остеопротективных свойств хвоща полевого ( <i>Equisetum arvense</i> ) и крапивы двудомной ( <i>Urtica dioica</i> ) в рецептуре хлеба как способа повышения его нутритивной ценности. .... | <b>245</b> |
| <b>Рахмонов К.С.</b> Технологические аспекты производства пшеничных сортов хлеба с использованием заквасок спонтанного брожения. ....                                                                                               | <b>254</b> |
| <b>Nazarova L.X.</b> Milliy non mahsulotlari. ....                                                                                                                                                                                  | <b>261</b> |
| <b>ТЎҚИМАЧИЛИК ВА ЕНГИЛ САНОАТ ТЕХНОЛОГИЯЛАРИ</b>                                                                                                                                                                                   |            |
| <b>Хо‘jayeva M.E., Gafurova N.T.</b> Yigiruvchilar maxsus kiyimi uchun mato tanlashda gazlama namunalari xususiyatlarining tahlili. ....                                                                                            | <b>266</b> |
| <b>Gulyayeva G.X., Musayev N.M., Mukimov M.M., Agzamova S.M., Karimova N.H.</b> Yangi tuzilishdagi ikki qatlamli trikotaj to‘qimalarini olish usuli. ....                                                                           | <b>275</b> |
| <b>Usmanova F.S., Tashkenbayeva T.B., Nabiyeu N.D.</b> Gidrofob xossa berishda maxalliy appretlarni qo‘llash imkoniyatlarini tadqiq qilish. ....                                                                                    | <b>280</b> |
| <b>Mardonov S.E., Sattarova N.N., Rahimova M.R.</b> Shlyapkali tarash mashinasi parametrlarining tola xossalari ta’siri. ....                                                                                                       | <b>285</b> |
| <b>Дустова Ф.Х.</b> Приводы машин текстильной и легкой промышленности. ....                                                                                                                                                         | <b>290</b> |
| <b>Gulyayeva G.X., Musayev N.M., Mukimov M.M., Agzamova S.M., Karimova N.H.</b> Yangi tuzilishli ikki qatlamli trikotaj to‘qimalarining fizik-mexanik xususiyatlar tahlili. ....                                                    | <b>294</b> |
| <b>Ismoyilov I.B., Qo‘ldoshev E.I., Ismoyilov F.B.</b> Yangi vintli tozalagichning konstruksiyasi va junni tozalash jarayoniga ta’sir etuvchi omillarning nazariy tadqiqi. ....                                                     | <b>299</b> |
| <b>Бахриддинов М.С., Бехбудов Ш.Х.</b> Использование упругих элементов в механизме иглы швейной машины. ....                                                                                                                        | <b>302</b> |
| <b>Saidova X.X.</b> Selection of an effective processing technology in the manufacturing of transformable clothing. ....                                                                                                            | <b>308</b> |
| <b>Saidova X.X., Boymatova K.A.</b> Ustki kiyimlarni tikish jarayonida hosil bo‘ladigan nuqsonlar. ....                                                                                                                             | <b>314</b> |
| <b>Sabirova Z. A., Jumaniyazova R.F.</b> O‘zbek milliy arxitekturasini va moda. ....                                                                                                                                                | <b>318</b> |
| <b>Giyasova D.R.</b> Aralash tarkibli ip olish texnologiyasi. ....                                                                                                                                                                  | <b>324</b> |
| <b>Мусиров Ш. З., Мирзаумидов А.Ш., Турдиев Б.Э., Пардаев Б.Ч.</b> Тебранувчи сирт юзасидаги чигитларнинг ҳаракатини динамик таҳлили. ....                                                                                          | <b>328</b> |
| <b>Toshpulotov L.I., Mardonov S.E.</b> Ikki qatlamli matolar tuzilishini loyihalashda zamonaviy kompyuter texnologiyalardan foydalanish. ....                                                                                       | <b>332</b> |
| <b>Нурбоев Р.Х., Салимов Ш.Х., Худайбердиев М.Р.</b> Аралаш толали ип ишлаб чиқаришда аралашмадаги толаларнинг хусусиятлари ва уларнинг нисбий улушига боғлиқлигини ўрганиш ва таҳлил қилиш. ....                                   | <b>338</b> |
| <b>Temirova G.I.</b> Mo‘ynali buyumlarni tayyorlashda polimer kompozitsyalardan foydalanishning resurstejamkor usullari. ....                                                                                                       | <b>342</b> |
| <b>Ташкенбаева Т.Б., Нигматова Ф.У., Вахобова Н.А.</b> Системный подход к проектированию функциональной одежды для людей в инвалидных колясках. ....                                                                                | <b>349</b> |
| <b>Машарибов А.Р., Райимкулов Ж.К., Эрдонов А.М.</b> Пахтани майда ифлосликлардан тозалашда қозикчали-планкачи барабан планкаларининг таъсири. ....                                                                                 | <b>360</b> |
| <b>Xamdullayeva S.O.</b> Zanjirli uzatma qadamining qayishqoq vtulka bikirligiga ta’sirini sintez qilish. ....                                                                                                                      | <b>365</b> |
| <b>Atajanov A.B.</b> Arrali jin kolosniklari ishchi qismining yeyilishini tadqiq etish. ....                                                                                                                                        | <b>368</b> |
| <b>Barakayeva D.F., Gafurova N.T.</b> Energetika sohasida ishlovchilar uchun himoya kiyimini ishlab chiqish omillarini o‘rganish. ....                                                                                              | <b>374</b> |
| <b>Azimova M.N.</b> Ayollar oyoq kiyimi uchun mo‘yna qiyimlari asosidagi polimer kompozitsion paketlarning shaklbardoshlik xususiyatlarini tadqiq etish. ....                                                                       | <b>378</b> |
| <b>Худайбердиев М.Р., Очилов Т.А., Хамроева С.А., Нурбоев Р.Х.</b> Тола таркиби турлича бўлган костюмбоп матоларнинг механик хоссаларининг тадқиқоти ва таҳлили. ....                                                               | <b>382</b> |

|                                                                                                                                                                                                             |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Худайбердиев М.Р., Очилов Т.А., Ҳамроева С.А., Нурбоев Р.Х.</b> Тола таркиби турлича бўлган костюмбоп матоларнинг ғижимланмаслиги ва ҳаво ўтказувчанлигининг ўзгариши                                    | <b>387</b> |
| <b>Каландаров Р.К.</b> Результаты теоретических и экспериментальных исследований . . . . .                                                                                                                  | <b>391</b> |
| <b>Эргашов М.</b> Взаимодействие шелковой нити с ценовым прутком шелкоткацкого станка .                                                                                                                     | <b>398</b> |
| <b>Yangiboyev I.B., Berdanov E.X., Axmedov M.X., Tuychiyev T.O.</b> Mayda iflosliklardan tozalash jarayonida kolosnikli panjarada paxta bo‘lakchalarining harakatini tahlili . . . . .                      | <b>404</b> |
| <b>To‘xtayeva Z.Sh., Abulova P.U.</b> O‘smirlar kiyimlari uchun tanlangan matolarning xususiyatlari tahlili . . . . .                                                                                       | <b>409</b> |
| <b>Rajabova G.J.</b> Apsaykling – hayot mazmuni . . . . .                                                                                                                                                   | <b>416</b> |
| <b>Sayidova M.H., Pulatova S.U.</b> Maxsus kiyim materiallarining termo-fizik parametrlarini aniqlovchi omillar . . . . .                                                                                   | <b>418</b> |
| <b>Сапаров М.К., Рузметов Р.И., Туйчиев Т.О., Авазмуратов А.Б., Машаринов К.М.</b> Анализ показателей качества волокна на этапах технологического процесса Шовотского хлопкоочистительного завода . . . . . | <b>423</b> |
| <b>Бозорова Ф.М.</b> Предлагаемая методика проведения экспериментов на узле ножки новой конструкции швейной машины . . . . .                                                                                | <b>428</b> |
| <b>Azimova G.A.</b> Mahalliy aralash jun matolarining eksport salohiyati . . . . .                                                                                                                          | <b>434</b> |
| <b>Rajabov A.I., Khamrayeva S.A., Nodirova M.N.</b> Jun, jun–akril va jun–poliester iplarning mexanik xossalarini qiyosiy tahlil qilish . . . . .                                                           | <b>438</b> |
| <b>АНИҚ ВА ИЖТИМОЙ-ИҚТИСОДИЙ ФАНЛАР</b>                                                                                                                                                                     |            |
| <b>Gafurova N.T., Hikmatov N.I.</b> Texnik oliy o‘quv yurtlarida zamonaviy ta’limning o‘ziga xos xususiyatlari . . . . .                                                                                    | <b>444</b> |
| <b>Shalov D.J., Fatilloev Sh.F., Mavlanov B.A., Maxmudov R.A.</b> Ipak qurti chiqindisidan turli bebaho baliqlar yemini tayyorlashda va mineral o‘g‘it sifatida qo‘llash . . . . .                          | <b>449</b> |
| <b>Raxmonov G‘.F.</b> Buxoro viloyati hududida mavjud ekoturizm obyektlarini o‘rganish va tahlil qilish . . . . .                                                                                           | <b>452</b> |
| <b>Мухамедбаев А.А., Бахритдинова С.Б.</b> Сравнительный анализ некоторых характеристик пористого заполнителя из дробленого автоклавного газобетона . . . . .                                               | <b>459</b> |
| <b>Samandarov I.R., Miratoyev Z.M.</b> Binar tasvirlardagi yassi ob’ektlar konturlarining metrik belgilarini ajratib olish usuli . . . . .                                                                  | <b>466</b> |
| <b>Саидова А.С., Файзиллоева Н.Б.</b> Модернизация высшего образования, как важный фактор развития наук. . . . .                                                                                            | <b>478</b> |

bo'lishi kuzatiladi. Bu esa raqamli fotoapparat va tasvirga raqamli ishlov beruvchi kompyuter dasturlari yordamida laboratoriya spektrofotometridan foydalanib diffuz aks ettirish spektroskopiyasi yordamida bo'yalgan matolarning koloristik xossalari yuqori aniqlikda o'chash shkalasi mavjud bo'ladi.

#### **Foydalanilgan adabiyotlar ro'yxati**

1. Полинский А.С., Пшежецкий В.С., Кабанов В.А. Особенности связывания ионов металла полимерными лигандами. Система Cu (II) -поли-4-винилпиридин // Докл.АН, 1981-. Т.256, № 1.-1834-1838.
2. Зенин А.Б., Кабанов Н.М., Кокорин А.И., Рогачева В.Б. Тройные полимер-металлические комплексы на основе полиакриловой кислоты линейного полиэтиленимитна и меди// Высомолек.соед., 1977.-Т.А, №1.-С.118-124.
3. Мирошниченко И.Б., Алимова Х.А., Ташпулатова Ю.Т., Федорова Н.А. Исследования процесса цветообразования на натуральном шелке, обрабатываемом методом диазотирования// Изв.Вузов, №2,2002,-С68
4. Абдурахманов Ш.Г., Негматов С.С., Рахимова З.М. Крашение текстильных материалов путем синтеза красителя на волокне // XVIII Национальный химический конгресс. Г.Карс, Турция. 2004.г.

*Ibragimova Maftuna Ibodulloyevna – Buxoro davlat tibbiyot instituti tayanch doktoranti.*

*Amonov Muxtar Raxmatovich – texnika fanari doktori, Buxoro davlat universiteti “Kimyo va neft-gaz texnologiya” kafedrası professori.*

#### **DEVELOPMENT OF COMPOSITE MATERIALS FOR CORROSION PROTECTION OF MAIN GAS AND OIL PIPELINES WITH INCREASED CHEMICAL ADHESION**

**Kadirxanov J., Urinov A.A.**

*Namangan state technical university.*

**Abstract.** At present, during new construction of trunk oil pipelines, as well as during re-insulation of existing pipelines for their anti-corrosion protection, various insulation materials and protective coating designs are used, ranging from bituminous-mastic trace application to multilayer polymer coatings of factory application. But with all the variety of protective coatings available, it is practically impossible to make a choice in favor of only one universal coating that would meet all requirements and provide effective corrosion protection of pipelines under various construction and operating conditions.

**Keywords:** corrosion, corrosion protection methods, gas condensate wells, neutral wells, oil production industry, destruction of tanks, poker technology, operation, production string, tubing, hydrogen sulfide corrosion, carbon dioxide corrosion.

#### **РАЗРАБОТКА КОМПОЗИТНЫХ МАТЕРИАЛОВ ДЛЯ ЗАЩИТЫ ОТ КОРРОЗИИ МАГИСТРАЛЬНЫХ ГАЗО- И НЕФТЕПРОВОДОВ С ПОВЫШЕННОЙ ХИМИЧЕСКОЙ АДГЕЗИЕЙ**

**Кадирханов Ж., Уринов А.А.**

*Наманганский государственный технический университет.*

**Аннотация.** В настоящее время при новом строительстве магистральных нефтепроводов, а также при переизоляции существующих трубопроводов для их антикоррозионной защиты используются различные изоляционные материалы и конструкции защитных покрытий — от битумно-мастичных слоев до многослойных полимерных покрытий заводского изготовления. Однако при всем разнообразии существующих защитных покрытий практически невозможно отдать предпочтение какому-либо одному универсальному покрытию, которое бы удовлетворяло всем требованиям и обеспечивало эффективную защиту трубопроводов от коррозии в различных условиях строительства и эксплуатации.

**Ключевые слова:** коррозия, методы защиты от коррозии, газоконденсатные скважины, нейтральные скважины, нефтедобывающая промышленность, разрушение резервуаров, технология «пoker», эксплуатация, эксплуатационная колонна, насосно-компрессорные трубы, коррозия сероводородом, коррозия углекислым газом.

# ASOSIY GAZ VA NEFT QUVURLARINI KORROZIYADAN HIMOYA QILISH UCHUN KIMYOVIY YOPISHQOQLIGI OSHIRILGAN KOMPOZIT MATERIALLARNI ISHLAB CHIQLASH

Kadirxanov J., Urinov A.A.

*Namangan davlat texnika universiteti.*

**Annotatsiya.** Hozirgi vaqtda magistral neft quvurlarini yangidan qurishda hamda mavjud quvurlarni qayta izolyatsiya qilish jarayonida ularni korroziyadan himoya qilish uchun turli izolyatsiya materiallari va himoya qoplamalari ishlatilmoqda. Ular oddiy bitum-mastika asosidagi izolyatsiyalardan tortib, zavodda qo'llaniladigan ko'p qatlamli polimer qoplamalargacha bo'lishi mumkin. Biroq mavjud himoya qoplamalarining xilma-xilligiga qaramay, barcha talablarga javob beradigan va har xil qurilish hamda ekspluatatsiya sharoitlarida quvurlarni samarali korroziyadan himoya qila oladigan yagona universal qoplamani tanlash deyarli imkonsizdir.

**Kalit so'zlar:** korroziya, korroziyadan himoya usullari, gaz kondensat quduqlari, neytral quduqlar, neft qazib olish sanoati, rezervuarlarning yemirilishi, poker texnologiyasi, ekspluatatsiya, quduq tubi quvurlari, quvurlar tizimi, vodorod sulfidli korroziya, karbonat angidridli korroziya.

**Introduction.** The choice of insulation materials and optimal protective coating systems is determined by many factors, but in general it is obvious that the highest performance is achieved by factory applied protective coatings of pipes, connecting parts and shut-off valves of pipelines. Only in stationary factory or base conditions it is possible to ensure high quality of pipe surface preparation (cleaning, technological heating to the required temperature) and application of protective coatings with the use of technologies, equipment and materials that cannot be used in the route method of pipeline insulation.

Corrosion damage of machine parts and mechanisms, gas and oil equipment during storage and application reduces reliability of operation and shortens their service life, corrosion products and protective materials removed from metal surfaces get into the environment and pollute it. Therefore, in all developed countries, the problems of protection of machinery against corrosion and environmental protection have been and remain relevant [1].

One of the most common methods of corrosion protection is coating the surface of metals with paint and varnish materials. If the protective coating on the metal has sufficient thickness or is sufficiently resistant to water and oxygen, it protects the metal from corrosion due to the mechanical barrier [2].

In this connection, there is a necessity to develop new composite materials on the basis of local raw materials and production wastes, allowing to reduce corrosiveness of main gas and oil pipelines.

**Results of the study and their analysis.** To date, during the construction of trunk oil pipelines polymer tape and bitumen-mastic coatings of trace application are practically not used. These types of protective coatings are used only during repair and re-insulation of oil pipelines. New construction of trunk pipelines is carried out using pipes, shaped connecting parts and pipeline gate valves with factory-applied coatings based on modern polymeric materials. In route conditions only isolation of the welded joints zone of pipelines by coatings based on heat shrinkable polymer tapes is carried out. Structurally such protective coating applied on liquid two-component epoxy primer is similar to the factory polyethylene coating and has rather high protective operational properties [3].

It should be noted that in the last 7-8 years the general level of corrosion protection of pipelines has significantly increased due to the introduction of new technologies, high-quality insulation materials, wide use of pipes and fittings with factory coatings in the construction of pipelines. It can also be stated that modern protective coatings, provided the requirements for construction and laying of pipelines are met, can ensure their accident-free (due to corrosion) operation for the entire period of operation (40-50 years and more) [4].

We have tested dozens of types of various protective coatings for pipelines and accumulated considerable experience in their practical application. The technology of factory insulation of pipes and pipeline elements has been mastered at a number of enterprises and continues to be implemented at high rates. The actual task is not only the development of new requirements for

protective coatings, but also the revision of existing standards, making changes and additions to them, introduction of new test methods.

External coatings used for anticorrosion protection of pipelines should meet certain technical requirements. At present the use of external coatings for corrosion protection of trunk and field pipelines is regulated by the Russian standard GOST R 51164-98 "Trunk Steel Pipelines. General requirements for corrosion protection".

We have tested dozens of types of various protective coatings for pipelines and accumulated considerable experience in their practical application. The technology of factory insulation of pipes and pipeline elements has been mastered at a number of domestic enterprises and continues to be implemented at high rates. The actual task is not only the development of new requirements for protective coatings, but also the revision of existing standards, making changes and additions to them, introduction of new test methods [5].

It should also be emphasized that from the moment of development of industry standards, from the establishment of reasonable, strict, but at the same time feasible technical requirements for coatings, the general improvement of the quality of corrosion protection of pipelines begins. Let's consider the main types of modern coatings currently used for corrosion protection of main oil pipelines [6].

Epoxy, polypropylene and polyethylene protective coatings are most often used as factory pipe coatings during construction of gas and oil trunk pipelines. In the USA, Canada, Great Britain and a number of other countries the most popular are factory epoxy pipe coatings with a thickness of 350-400 microns. Pipe coatings based on powder epoxy paints have high adhesion to steel, resistance to cathodic peeling, increased (up to 80-100°C) heat resistance [7]. At the same time, the low impact strength of epoxy coatings, especially at subzero temperatures, largely limits the scope of their application. This is the reason why the factory insulation of pipes with epoxy powder coatings, which was first introduced at the Volzhsky Pipe Plant more than 20 years ago, has not been widely used in our country. Epoxy coatings could not compete with factory polyethylene pipe coatings [8].

In foreign practice in recent years more and more preference is given to two-layer epoxy pipe coatings. Such coatings, consisting of inner insulating and outer protective layer with total thickness of 750-1000 microns, have high resistance to abrasive wear, abrasion, have increased impact strength, which practically does not change at ambient temperatures from + 40°C to - 40°C [9].

Single-layer factory epoxy coatings are recommended for construction of oil pipelines up to and including 530 mm in diameter, and two-layer epoxy coatings are recommended for construction of pipelines up to and including 820 mm in diameter. It is most preferable to use this type of protective coating for insulation of pile supports, for construction of pipeline sections by trenchless laying method, for anticorrosion protection of "hot" (up to 80-100°C) sections of pipelines, as well as for anticorrosion coating of pipes with heat-insulating polyurethane foam coating. One of the most promising external coatings of pipelines is undoubtedly factory polypropylene coatings.



*Figure 1. Types of anti-corrosion coatings for main pipes*

Many methods are known to combat corrosion. Of these, several main groups can be distinguished. The first group of protection is applied at the stage of metal production during its metallurgical and mechanical processing. The general theory of alloying is based on three main factors that characterize the effectiveness of the corrosion element [8].

The corrosion rate can be reduced or prevented altogether by creating alloys that form a layer of corrosion products with high protective properties on their surface under the action of aggressive medium. Alloying of structural steels with copper-zinc and aluminum contributes to the increase of protective properties of the surface layer and eliminates the possibility of internal stresses in it [9].

The most universal way to protect metals from corrosion is the application of both metallic and non-metallic coatings on the metal surface.

The main purpose of the protective coating is, on the one hand, to create a barrier layer that prevents the penetration of corrosive medium to the metal surface, and on the other hand, to limit or completely prevent the formation of a new phase of corrosion products at the metal-coating interface. The material of the protective coating, first of all, should have high chemical stability, weak permeability to water, gases, chlorine vapor, sulfate, etc., good to the metal, mechanical strength and stability of the structure.

We have investigated physical, chemical and technological properties of the developed anticorrosive materials.

On the surface of the building material during a certain time and at a given pressure did not occur any changes, that is, on the surface of the sample did not appear water, hence the material is considered to have withstood the test, quality assessments of the developed composite anticorrosive material are shown in Table 1.

**Table 1. Quality of the developed composite anticorrosive material**

| Name of indicators                                                             | Composite anticorrosive material  |
|--------------------------------------------------------------------------------|-----------------------------------|
| Appearance                                                                     | Homogeneous liquid of black color |
| Drying time, at 20°C                                                           | 5 minutes                         |
| Adhesion strength, MPa                                                         | 0,2                               |
| Thickness of one layer, mm                                                     | 1,0                               |
| Consumption per one layer, kg/m <sup>2</sup>                                   | 1,7-2,0                           |
| Water absorption within 24 h% by weight                                        | 0,11                              |
| Water resistance during 72 h at pressure not less than 0,001 MPa               | Resists                           |
| Softening point, °C, not lower than                                            | 80                                |
| Loss of mass when material is heated (Q), %                                    | 0,24                              |
| Density at 200C, g/cm <sup>3</sup>                                             | 0,94 г/см <sup>3</sup>            |
| Mass fraction of non-volatile substances, %, not less than                     | 60                                |
| Flexibility on a bar with radius 5,0±0,2 mm at temperature 5°C (GOST 26589-94) | No cracks                         |
| Warranty storage period                                                        | 18 months                         |

**Table 2. Protective effect of the developed anticorrosive coating at salt-acid corrosion on “D” grade steel**

| Anticorrosive material | HCl concentration, % | Corrosion rate, g/m <sup>2</sup> h | Degree of protection, % |
|------------------------|----------------------|------------------------------------|-------------------------|
|                        | 23                   | 32,4601                            | 90                      |

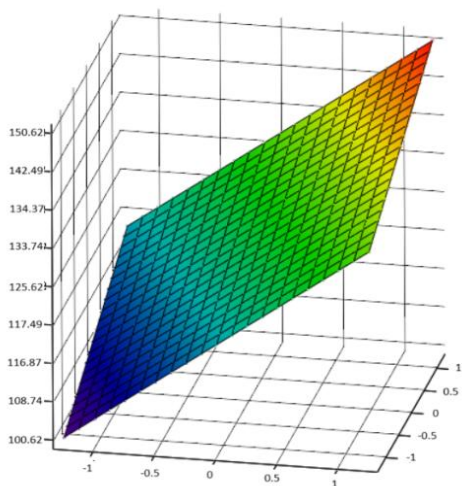
In order to determine the optimal values of the obtained research results, a full factor experiment was conducted [10]. Table 3 shows the values of the input factors.

**Table 3. Input factors**

| o/n | Factors                            | Designation    | levels of variation |    |    | variation |
|-----|------------------------------------|----------------|---------------------|----|----|-----------|
|     |                                    |                | -1                  | 0  | +1 |           |
| 1   | Corrosion rate, g/m <sup>2</sup> h | X <sub>1</sub> | 30                  | 35 | 40 | 5         |
| 2   | HCl concentration, %               | X <sub>2</sub> | 15                  | 25 | 35 | 10        |
| 3   | Drying time, min                   | X <sub>3</sub> | 10                  | 13 | 16 | 3         |

**Table4. Planning matrix**

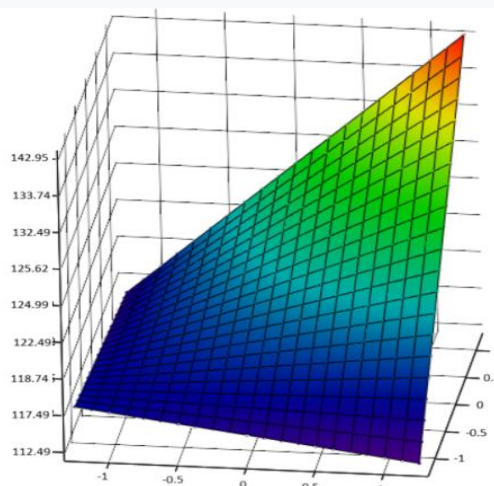
| /n | X <sub>1</sub> | X <sub>2</sub> | X <sub>3</sub> | Y <sub>1</sub> |
|----|----------------|----------------|----------------|----------------|
|    | 75             | 80             | 10             | 95             |
|    | 95             | 80             | 10             | 105            |
|    | 75             | 120            | 10             | 130            |
|    | 95             | 120            | 10             | 140            |
|    | 75             | 80             | 16             | 110            |
|    | 95             | 80             | 16             | 125            |
|    | 75             | 120            | 16             | 140            |
|    | 95             | 120            | 16             | 160            |
|    | 85             | 100            | 13             | 125            |
| 0  | 85             | 100            | 13             | 126            |
| 1  | 85             | 100            | 13             | 125            |



$$= 125,62 + 16,875 * x_2 + 8,125 * x_3$$

$$(x_1=0)$$

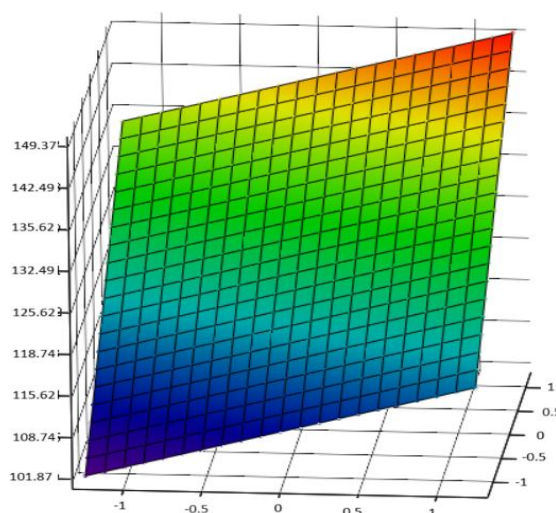
Corrosion rate  $x_1 = 28 \div 36$ , drying time  
 $x_3 = 10 \div 20$   $x_2 = 0$



$$y = 125,62 + 6,875 * x_1 + 8,125 * x_3 + 1,875 * x_1 * x_3$$

$$(x_2=0)$$

HCl concentration  $x_2 = 21 \div 25$ ,  
drying time  $x_3 = 10 \div 20$   $x_1 = 0$



$$y = 125,62 + 6,875 * x_1 + 16,875 * x_2 \quad (x_3=0)$$

Corrosion rate  $x_1 = 28 \div 36$ , HCl concentration  $x_2 = 21 \div 25$ ,  $x_3 = 0$

Thus, as a result of the full factor experiment it is established that the efficiency of corrosion protection has high indicators at corrosion rate equal to 32 (g/m<sup>2</sup>-h), the percentage of HCl concentration 23% and the drying time of anticorrosion composition 15 minutes. Based on the results of the experiment it can be concluded that the identified optimal parameters allow to develop an effective and resource-saving formulation of anticorrosion coating. The obtained results will be used to select the optimal concentration that effectively protects oil and gas pipelines from corrosion.

**Conclusion.** The developed composite anticorrosive material is considered to have passed the test if there are no signs of swelling, displacement of the cover layer and excessive elongation on the surface of the sample. Indeed, the results of the experiments showed the obtaining of a high-quality bituminous composition, not inferior to the requirements of standards. On the basis of physical and mechanical studies proved the possibility of obtaining a competitive bitumen composition that meets the requirements of standards.

### References

1. Gafarov N.A., Kholzakov N.V., Maniachenko A.V. et al. Problems of Increasing the Reliability of Corrosion Protection of Orenburg OGCF Equipment. // Materials "Scientific and Technical Solutions to Increase the Effectiveness of Corrosion Inhibitors". Moscow; OOO "IRC Gazprom", 2000. p. p. 3-19. 3-19.
2. Kolotyarkin Y.M. Modern Methods of Anticorrosion Protection. // Metal Protection. - 1993. T.29, №2. -с. 119-121.
3. Antropov L.I., Pochrebeva I.S. Corrosion and Corrosion Protection. Results of Science and Technology. M.; VNIITIB 1973. - Vol. 2. - p. 27-112.
4. Negmatov S.S., Anvarova M.T., Negmatova K.S., Rakhimov Y.K., Raupova D.N., Rakhimov H.Y. Studies of the protective effect of inhibitor PGS-2 in laboratory conditions. // Republican Scientific and Technical Conference "New composite and nanocomposite materials: structure, properties and application". April 5-6, 2018, Tashkent, Uzbekistan, pp.293-294.
5. Geraskin V.I., Kirillov A.P., Nizamov N.F. Main directions of solving the problems of anticorrosion protection of equipment of Astrakhan GCF. //Materials of the Scientific and Technical Conference "Scientific and Technical Solutions to Increase the Effectiveness of Corrosion Inhibitors". Moscow; OOO "IRC Gazprom", 2000. p. p. 19-35. 19-35.
6. Ivanov S. I. I., Nurgaliev D. M. Research, technological evaluation and introduction of new corrosion inhibitors for the protection of equipment and gas pipelines operating in corrosive

- environments of OGKM (Orenburg Gas Chemical Complex). // Environmental Protection in Oil and Gas Complex. 2005, №7, - с. 54-78.
7. Melesetdinov A. S. Investigation of corrosion resistance of metals used in the development of hydrogen sulfide-containing fields. // Corrosion and protection of pipelines, wells, gas-field and gas-processing equipment. - Moscow; 1975, - p. 20-25.
  8. Mikhailovsky Y. K. Atmospheric corrosion of metals and their protection. M.; Metallurgy, 1989, - 103 p.
  9. Kukurs O., Upite A., Honzak I., et al. Products of atmospheric corrosion of iron and rust coloring. - Riga.; 1980, - 163 p.
  10. Tikhomirov V.B. Planning and Analysis of Experiment (In light industry). M., "Light industry". 1974.-262 p.

*Kadirxanov Jamshid – Associate Professor, Namangan state technical university.*

*E-mail: [Kadirxanov@mail.ru](mailto:Kadirxanov@mail.ru)*

*Urinov Abrorbek Axrorovich – PhD, Namangan state technical university. Tel: +998919799275 E-mail: [abrormagnat@mail.ru](mailto:abrormagnat@mail.ru)*

## ГИДРОФОБНАЯ КОМПОЗИЦИЯ ДЛЯ СТРОИТЕЛЬНЫХ МАТЕРИАЛОВ НА ОСНОВЕ ГИПСА И ЕЕ СОСТАВ

<sup>1</sup>Рахимов Ф.Ф., <sup>1</sup>Беков У.С., <sup>2</sup>Сафарова Р.У.

<sup>1</sup>*Бухарского государственного технического университета,*

<sup>2</sup>*Бухарский государственный педагогический институт.*

**Аннотация.** В данной работе представлено синтезированное кремнийорганическое соединение полностью нерастворимо в бензоле, толуоле, гексане и воде при концентрации 10% по отношению к объему растворителя, но растворимо в ДМСО, ДМФА, этаноле, пропанол, н-бутаноле, изопропиловом спирте, ацетоне, диоксане и диэтиловом эфире. Тестовые эксперименты проводились на основе полимеров, взятых от 3% до 10% по отношению к массе гипса.

**Ключевые слова:** полимер, фенолформальдегид, гипс, бензол, толуол, гексан, ДМСО, ДМФА, этанол, пропанол, н-бутанол, изопропиловый спирт, ацетон, диоксан и диэтиловый эфир, гидрофобизатор.

## GIPS ASOSIDAGI QURILISH MATERIALLARI UCHUN GIDROFOB KOMPOZITSIYA VA UNING TARKIBI

<sup>1</sup>Raximov F.F., <sup>1</sup>Bekov U.S., <sup>2</sup>Safarova R.U.

<sup>1</sup>*Buxoro davlat texnika universiteti, <sup>2</sup>Buxoro davlat pedagogika instituti.*

**Annotatsiya.** Ushbu maqolada erituvchi hajmiga nisbatan 10% konsentratsiyada benzol, toluol, geksan va suvda to'liq erimaydigan, ammo DMSO, DMF, etanol, propanol, n-butanol, izopropil spirt, aseton, dioksan va dietiloterda eriydigan sintezlangan kremniy organokorik birikmasi keltirilgan. Sinov tajribalari gips massasiga nisbatan 3% dan 10% gacha olingan polimerlar asosida o'tkazildi.

**Kalit so'zlar:** polimer, fenolformaldegid, gips, benzol, toluol, geksan, DMSO, DMF, etanol, propanol, n-butanol, izopropil spirt, aseton, dioksan va dietil efir, gidrofobizator.

## HYDROPHOBIC COMPOSITION FOR GYPSUM-BASED BUILDING MATERIALS AND ITS COMPOSITION

<sup>1</sup>Raximov F.F., <sup>1</sup>Bekov U.S., <sup>2</sup>Safarova R.U.

<sup>1</sup>*Bukhara State Technical University, <sup>2</sup>Bukhara State Pedagogical Institute.*

**Abstract.** In this work, the synthesized organosilicon compound is presented, which is completely insoluble in benzene, toluene, hexane and water at a concentration of 10% relative to the volume of the solvent, but is soluble in DMSO, DMF, ethanol, propanol, n-butanol, isopropyl alcohol, acetone, dioxane and diethyl ether. Test experiments were carried out on the basis of polymers taken from 3% to 10% relative to the mass of gypsum.

**Keywords:** polymer, phenol formaldehyde, gypsum, benzene, toluene, hexane, DMSO, DMF, ethanol, propanol, n-butanol, isopropyl alcohol, acetone, dioxane and diethyl ether, water repellent, water absorption, water repellent, plasticizing polymer.