HYDROCARBON SOLVENTS FROM THE RESIN OF UNDERGROUND GASIFICATION OF ANGREN COAL

Qodirova Feruza
Senior teacher of Namangan Institute of Engineering and Construction
No'monova Sohiba
Teacher of Namangan Institute of Engineering and Construction
Mo'ydinova Nilufar
Teacher of Namangan Institute of Engineering and Construction
Mukhtaraliyeva Mukhtasar
Teacher of Namangan Institute of Engineering and Construction

Abstract. The article discusses the technology of coal production, its components, ways of using it as fuel. Mainly information is given on technologies of gasification of coal from Angren coal mine, and information on methods is also given.

Key words: coal, gasification, extraction, technological methods, raw materials

Coking resin can be used as a raw material for the production of hydroaromatic solvents.

The resources of raw materials for valuable solvents can also be expanded at the expense of those quantities of underground coal gasification (UCG) tar, which will be obtained under the condition of industrial implementation of underground gasification of Angren coals. The properties and chemical composition of resins for semi-coking and underground coal gasification are identical. This allows the development of a number of similar processes based on them.

In contrast to semi-coking resin, CCGT resin was subjected to heat treatment at the first stage under a hydrogen pressure of 40 atm. and a temperature of 400°C. The experiments were carried out on a laboratory microinstallation with a reactor volume of 20 ml.

№	Resin Sample Characteristic	
1	Density at 20°C, g/cm^3	1,0343
2	Relative molecular weight	213
3	Viscosity at 50 ^{0}C, m^2/s (eat)	18,5.10 -^{6} (18,5)
4	The amount of insoluble substances in C_6H_6,%	0,26
5	Ash content, %	0,055
Fractional composition, %:		
1	distillation to 100°C	2,7
2	100 — 200°C	4,5

3	200 — 250°C	25,0
4	250 — 300°C	18,5
5	remainder above 300°C	49,3

Thermal hydrogenation contributed to the production of a product in which the content of aromatic hydrocarbons increased from 32% to 76.5%. The yield of the hydrogenate in the optimal experiment at a space velocity of 1.5–2.0 h-1 was 95%. Hydrogenate fraction 200–300°C was isolated by distillation, which was subjected to hydrogenation on a nickel-molybdenum catalytic system at 300°C, space velocity 0.5 h–1, pressure 50 atm, and hydrogen molar concentration 7:1. The composition and properties of the hydrogenation feedstock, the conditions for an optimal hydrogenation experiment, and the characterization of the hydrogenation product are given above.

The composition and properties of the feedstock for the production of solvents

Density at 20°C, g/cm^3	1,0238
Index of refraction, n_d^{20} at 20°C	1,5820
Drum index coefficient. Z	36
Viscosity, m^2/s (cst)	13,2.10 $^{-6}$ (13,2)
Relative molecular weight	171
Iodine number mg ioa/100 g	31,14
Amount of sulfonated hydrocarbons %, mass	97,5

Boiling limits, °C: Н. к – 223; 10% - 235; 20% - 247; 30% - 255; 50% - 280; 70% - 288; 80% - 298, 92% - 300.

Conditions for an optimal hydrogenation experience and characterization of the hydrogenate:

1	Catalyst	“Nickelmolybdenum system”
2	Temperature, °C	300
3	Volumetric velocity, ch^{-1}	0,5
4	Yield of hydrogenate, % mass.	92
5	Hydrogen consumption, %	1,4
6	Hydrogenizate viscosity, m^2/s (cst)	6,2 • 10^{-6} (6,2)
7	Density at 20°C, g/sm^3	0,9222
8	Relative molecular weight	189
9	Refractive index, n_d^{20} at 20°C	1,4993
10	Iodine number, mg iodine/100 g.	15,5

The data show that the hydrogenation process contributed to a significant decrease in the viscosity of the product, saturation of unsaturated hydrocarbons. The results of narrow fractionation, the data of which are given in table. 1 show that the hydrogenation process made it possible to obtain not only medium-boiling, but also some low-boiling hydrocarbons. The values of the index of refraction of the isolated fractions indicate the content of predominantly hydroaromatic hydrocarbons in them. The absence of pure samples of hydrogenated hydrocarbons and their homologues did not allow us to characterize these fractions in more detail [1].

Table 1 - Results of narrow fractionation of pyrocondensate after hydrofinishing

Boiling limits, ^0C	Exit %	Refractive index при 20°C	Boiling limits, °C	Exit, %	Refractive index при 20°C
Н.к.87,6	-	-	196,7-204,6	1,3	1,4880
87,6-100,7	2,7	1,4392	204,6-208,6	-	-
100,7-107,6	-	-	208,6-209,6	1,5	1,4900
107,6-109,6	1,3	1,4340	209,6-212,6	2,8	1,4910
109,6-122,8	-	-	212,6-220,7	-	-
122,8-136,0	3,7	1,4350	220,7-221,7	3,2	1,4930
136,0-143,4	1,1	1,4403	221,7-222,7	-	-
143,4-144,0	-	-	222,7-225,7	2,6	1,4960
144,0-146,0	2,3	1,4480	225,7-227,7	-	-
146,0-162,7	-	-	227,7-232,7	5,3	1,5010
162,7-164,7	1,3	1,4570	232,7-239,9	-	-
164,7-165,0	-	-	239,9-244,0	8,2	1,5060
165,0-168,5	2,9	1,4603	244,0-246,6	-	-
168,5-174,5	-	-	246,6-251,6	5,3	1,5120
174,5-177,5	2,7	1,4640	Remainder above 251,6	37,0	-
177,5-185,2	8,0	1,4710			
185,2-194,7	-	-	Static delay + loss	3,1	-
194,7-196,7	3,7	1,4815	-	3,1	-

Of interest is the fact that the entire resin of underground coal gasification was used as a raw material, without preliminary separation of phenols and bases from it. The economic feasibility of the technology for obtaining hydroaromatic hydrocarbons during the processing of resin is indisputable. It eliminates the inevitable loss of part of the raw material during its dephenolization and depyridination.

Literature

1. Кодиров, Д. Т., & Кодирова, Ф. М. (2021). Алгоритмы совместного оценивания вектора состояния и параметров динамических систем. *Universum: технические науки*, (7-1 (88)), 66-68.
2. Kodirov, D. T., Kodirova, F. M., Haydarov, B., & Negmatov, U. (2020). Algorithms For Stable Estimation Of The Extended State Vector Of Controlled Objects. *Solid State Technology*, *63*(6), 14903-14909.
3. Kodirova, F. U. (2019). Modern Approaches to Preparing Disabled Children for Social Life in Uzbekistan.

4. Кодиров, Д. Т., Кодирова, Ф. М., & Юлдашбаев, А. А. (2022). АНАЛИЗ АЛГОРИТМОВ УПРАВЛЕНИЯ ПРОЦЕССОМ НИЗКОТЕМПЕРАТУРНОЙ СЕПАРАЦИИ. *Главный редактор: Ахметов Сайранбек Махсутович, д-р техн. наук; Заместитель главного редактора: Ахмеднабиев Расул Магомедович, канд. техн. наук; Члены редакционной коллегии*, 39.
5. Кодиров, Д. Т., & Кодирова, Ф. М. (2020). ПЕРСПЕКТИВНЫЕ ЭНЕРГОНОСИТЕЛИ БУДУЩЕГО. *Вестник Науки и Творчества*, (5 (53)), 50-53.
6. Эшмухамедов, М. А., & Кадырова, Ф. М. (2018). Гидрирование непредельных углеводородов углехимического происхождения на никелевом катализаторе. *Рецензент: ЕА Лисица главный врач филиала Федерального бюджетного учреждения здраво-охранения «Центр гигиены и эпидемиологии в Хабаровском крае, в городе Комсомольске-на-Амуре, Комсомольском районе» Редакционная коллегия*, 123.
7. Qodirova, F. CURRENT ISSUES AND STRATEGIES OF PREPARING THE CHILDREN WITH LIMITED ABILITIES FOR SOCIAL LIFE IN UZBEKISTAN.
8. Feruza, Q. (2022). TECHNOLOGY FOR PROCESSING CARBON DIOXIDE EXHAUSTED FROM THE MIXTURE OF EXHAUST GAS FLOWS. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, *2*(9), 252-255.
9. Qodirova, F. (2022). PRODUCTION OF PRODUCTS FROM RESINS OF UNDERGROUND COAL GASIFICATION. *Science and innovation*, *1*(A6), 129-132.
10. No‘Manova S. E. Ta’lim jarayonida talabalarning amaliy bilimlarini rivojlantirish metodikasi //Oriental renaissance: Innovative, educational, natural and social sciences. – 2021. – Т. 1. – №. 9. – С. 585-589.
11. Алимджанова, Д., Акбаров, А., & Муйдинова, Н. К. (2017). Способ повышения эффективности горения угольного топлива в кольцевой печи. In *Issues of modern education in the condition of globalization. Collection international scientific conference*.
12. Mukhtasar, M. (2021). Improving the methodology of teaching virtual lessons on the basis of modern digital technologies. *Journal of Advanced Scientific Research (ISSN: 0976-9595)*, *1*(1).
13. No‘Manova S. E. Qurilish materiallari, buyumlari va konstruksiyalarini ishlab chiqarish //Oriental renaissance: Innovative, educational, natural and social sciences. – 2021. – Т. 1. – №. 9. – С. 605-608.
14. Абдуманнопов, Н. А. (2018). Модернизация кольцевой печи для обжига строительного кирпича. *Научное знание современности*, (12), 25-29.
15. Sharopov, B., & Muxtoraliyeva, M. (2022). PEDAGOGIKA FANINING METODOLOGIYASI. *PEDAGOGS jurnali*, *2*(2), 259-262.
16. Ergashboevna N. S. METHODOLOGY OF DEVELOPING STUDENTS'PRACTICAL KNOWLEDGE ON THE BASIS OF CLUSTER APPROACH IN THE PROCESS OF TEACHING BUILDING MATERIALS AND PRODUCTS //Scientific Impulse. – 2022. – Т. 1. – №. 2. – С. 629-632.
17. Алимджанова, Д. И., & Муйдинова, Н. К. К. (2020). Повышение эффективности горения угольного топлива в кольцевой печи для обжига строительного кирпича. *Universum: технические науки*, (4-1 (73)), 67-71.
18. Sharopov, B., & Muxtoraliyeva, M. Pedagogika fanining metodologiyasi. Pedagogs international research journal. 259-262 (2). Volume-2, Issue-1.
19. Ergashboevna N. S. USE OF MULTIMEDIA TECHNOLOGIES IN THE PROCESS OF TEACHING BUILDING MATERIALS AND PRODUCTS //CENTRAL ASIAN JOURNAL OF THEORETICAL & APPLIED SCIENCES. – 2022. – Т. 3. – №. 6. – С. 126-129.
20. Алимджанова, Д. И., Абдусатторов, Ш. М., Муйдинова, Н. К. К., & Абдуганиев, Ш. Х. У. (2021). Водоугольное топливо на основе бурого угля Ангренского месторождения. *Universum: технические науки*, (3-2 (84)), 68-72.
21. Мухторалиева, М. (2022). Қурилиш соҳасида мутахассислик фанларини ўқитиш тамойиллари. *Analytical Journal of Education and Development*, *2*(6), 114-118.

22. Numanova S. E. Energy-efficient modern constructions of external walls //Экономика и социум. – 2021. – №. 1-1. – С. 193-195.
23. Mo'Ydinova, N. (2022). G'ISHT ISHLAB CHIQARISH TEXNOLOGIK JARAYONLARI VA TARKIBI HAQIDA. *Science and innovation*, *1*(A8), 493-498.
24. Mukhtoralieva, M., Rakhmonov, S., & Ganiev, A. (2022). THE ESSENCE OF TEACHING BASED ON THE COMPETENCE APPROACH TO THE HIGHER EDUCATION PROCESS. *Science and innovation*, *1*(B7), 784-788.
25. Хамидов А. И., Нуманова С. Э., Жураев Д. П. У. Прочность бетона на основе безобжиговых щёлочных вяжущих, твердеющего в условиях сухого и жаркого климата //Символ науки. – 2016. – №. 1-2. – С. 107-109.
26. Muxtoraliyeva, M., Xayitboyev, S., & Nazirova, M. (2022). QURILISH MATERIALLARI VA BUYUMLARI FANINI O 'QITISHDA INTERFAOL TA 'LIM METODLARI. *Science and innovation*, *1*(C6), 146-152.
27. Mavlonov R. A., Numanova S. E., Umarov I. I. Seismic insulation of the foundation //EPRA International Journal of Multidisciplinary Research (IJMR)-Peer Reviewed Journal. – 2020. – Т. 6. – №. 10.
28. Sharopov, B., Hakimov, S., Umarov, I., Muxtoraliyeva, M., Dadaxanov, F., & Abdunazarov, A. (2022). QUYOSH ENERGIYASIDAN FOYDALANIB TURAR JOY BINOLARI QURISHNING ISTIQBOLI TOMONLARI. *Journal of new century innovations*, *18*(1), 135-141.
29. Мавлонов Р. А., Нуманова С. Э. ЭФФЕКТИВНОСТЬ СЕЙСМИЧЕСКОЙ ИЗОЛЯЦИИ В ЖЕЛЕЗОБЕТОННЫХ МНОГОЭТАЖНЫХ КАРКАСНЫХ ЗДАНИЯХ //НАУЧНЫЙ ЭЛЕКТРОННЫЙ ЖУРНАЛ «МАТРИЦА НАУЧНОГО ПОЗНАНИЯ». – С. 37.
30. Hakimov, S., Sharopov, B., Umarov, I., Muxtoraliyeva, M., Dadaxanov, F., & Abdunazarov, A. (2022). URILISH MATERIALLARI SANOATIDA INNOVATSION MATERIALLAR ISHLAB CHIQARISHNING ISTIQBOLLI TOMONLARI. *Journal of new century innovations*, *18*(1), 149-156.
31. Mavlonov R. A., Numanova S. E. Effectiveness of seismic base isolation in reinforced concrete multi-storey buildings //Journal of Tashkent Institute of Railway Engineers. – 2020. – Т. 16. – №. 4. – С. 100-105.
32. Kazadayev, A., Sharopov, B., Hakimov, S., Umarov, I., Muxtoraliyeva, M., Dadaxanov, F., & Abdunazarov, A. (2022). MAMLAKATIMIZDA NEMIS TA'LIM TIZIMINI JORIY QILISHNING SAMARADORLIGI TAHLILI. *Journal of new century innovations*, *18*(1), 124-129.
33. Ризаев Б. Ш., Мавлонов Р. А., Нуманова С. Э. Деформации усадки и ползучести бетона в условиях сухого жаркого климата //Символ науки. – 2016. – №. 5-2. – С. 95-97.
34. Хамидов, А. И., Шаропов, Б. Х., & Мухтаралиева, М. А. (2022). Исследования золо-шлаковых смесей для производства строительных материалов.
35. Mavlonov R. A. Qurilish konstruksiyasi fanini fanlararo integratsion o'qitish asosida talabalarni kasbiy kompetentligini rivojlantirish metodikasi //Oriental renaissance: Innovative, educational, natural and social sciences. – 2021. – Т. 1. – №. 9. – С. 600-604.
36. Абдуназаров, А., Хакимов, С., Умаров, И., Мухторалиева, М., Дедаханов, Ф., & Шаропов, Б. (2022). МЕРОПРИЯТИЯ ПО ПОВЫШЕНИЮ ЭНЕРГОЭФФЕКТИВНОСТИ СОВРЕМЕННЫХ И РЕКОНСТРУИРУЕМЫХ ЗДАНИЙ. *Journal of new century innovations*, *18*(1), 130-134.
37. Sodiqjon, K., Begyor, S., Aleksandr, K., Farrukh, D., Mukhtasar, M., & Akbarjon, A. (2022). PROSPECTIVE ASPECTS OF USING SOLAR ENERGY. *Journal of new century innovations*, *18*(1), 142-148.
38. Mukhtasar, M., Begyor, S., Aleksandr, K., Farrukh, D., Isroil, U., Sodiqjon, K., & Akbarjon, A. (2022). ANALYSIS OF THE EFFECTIVENESS OF THE DEVELOPMENT OF THE GERMAN EDUCATION SYSTEM IN OUR COUNTRY. *Journal of new century innovations*, *18*(1), 168-173.

39. Dadakhanov, F., Sharopov, B., Umarov, I., Mukhtoraliyeva, M., Hakimov, S., Abdunazarov, A., & Kazadayev, A. (2022). PROSPECTS OF INNOVATIVE MATERIALS PRODUCTION IN THE BUILDING MATERIALS INDUSTRY. *Journal of new century innovations*, *18*(1), 162-167.
40. Begyor, S., Isroil, U., Aleksandr, K., Farrukh, D., Mukhtasar, M., Sodiqjon, K., & Akbarjon, A. (2022). MEASURES TO IMPROVE THE ENERGY EFFICIENCY OF MODERN AND RECONSTRUCTED BUILDINGS. *Journal of new century innovations*, *18*(1), 157-161.
41. Akhmedov, I., Khamidov, A., Shavkat, Y., Jalalov, Z., Umarov, I., & Kazadayev, A. (2022). RESEARCH OF ASH-SLAG MIXTURES FOR PRODUCTION OF CONSTRUCTION MATERIALS. *Spectrum Journal of Innovation, Reforms and Development*, *10*, 85-91.
42. Khamidov, A., Akhmedov, I., Shavkat, Y., Jalalov, Z., Umarov, I., Xakimov, S., & Aleksandr, K. (2022). APPLICATION OF HEAT-INSULATING COMPOSITE GYPSUM FOR ENERGY-EFFICIENT CONSTRUCTION. *Spectrum Journal of Innovation, Reforms and Development*, *10*, 77-84.
43. Khamidov, A., Akhmedov, I., Shavkat, Y., Jalalov, Z., Umarov, I., Xakimov, S., & Abdunazarov, A. (2022). INVESTIGATION OF THE PROPERTIES OF CONCRETE BASED ON NON-FIRING ALKALINE BINDERS. *Spectrum Journal of Innovation, Reforms and Development*, *10*, 92-100.
44. Akhmedov, I., Khamidov, A., Shavkat, Y., Umarov, I., & Kazadayev, A. (2022). DISTRIBUTION OF SEDIMENTS IN THE MOUNTAIN RIVER BED. *Spectrum Journal of Innovation, Reforms and Development*, *10*, 101-106.
45. Шаропов, Б. Х., Хакимов, С. Р., & Рахимова, С. (2021). Оптимизация режимов гелиотеплохимической обработки золоцементных композиций. *Матрица научного познания*, (12-1), 115-123.
46. Yuvmitov, A., & Hakimov, S. R. (2021). Influence of seismic isolation on the stress-strain state of buildings. *Acta of Turin Polytechnic University in Tashkent*, *11*(1), 71-79.
47. Хакимов, С., Шаропов, Б., & Абдуназаров, А. (2022). БИНО ВА ИНШООТЛАРНИНГ СЕЙСМИК МУСТАҲКАМЛИГИ БЎЙИЧА ХОРИЖИЙ ДАВЛАТЛАР (РОССИЯ, ЯПОНИЯ, ХИТОЙ, АҚШ) МЕЪЁРИЙ ХУЖЖАТЛАРИ ТАҲЛИЛИ. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, 806-809.
48. Хакимов, С. (2022). АКТИВ ВА ПАССИВ СЕЙСМИК УСУЛЛАРИ ҲАМДА УЛАРНИНГ АСОСИЙ ВАЗИФАЛАРИ. *Journal of Integrated Education and Research*, *1*(2), 30-36.
49. Ювмитов, А. С., & Хакимов, С. Р. (2020). ИССЛЕДОВАНИЕ ВЛИЯНИЯ СЕЙСМОИЗОЛЯЦИИ НА ДИНАМИЧЕСКИЕ ХАРАКТЕРИСТИКИ ЗДАНИЯ. *Acta of Turin Polytechnic University in Tashkent*, *10*(2), 14.
50. Yuldashev, S., & Xakimov, S. (2022). ТЕМИР ЙЎЛ ТРАНСПОРТИДАН КЕЛИБ ЧИҚАДИГАН ТЕБРАНИШЛАР ҲАҚИДА. *Science and innovation*, *1*(A5), 376-379.
51. Xakimov, S., & Dadaxanov, F. (2022). STATE OF HEAT CONDUCTIVITY OF WALLS OF RESIDENTIAL BUILDINGS. *Science and innovation*, *1*(C7), 223-226.
52. Мавлонов Р. А. ПРОФЕССИОНАЛ ТАЪЛИМ ТИЗИМИДА ФАНЛАРАРО ИНТЕГРАЦИЯНИ АМАЛГА ОШИРИШНИНГ ДОЛЗАРБЛИГИ //Oriental renaissance: Innovative, educational, natural and social sciences. – 2022. – Т. 2. – №. 5-2. – С. 347-351.
53. 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.
54. Ахмедов, И. Ғ., Ортиқов, И. А., & Умаров, И. И. (2021). Дарё ўзанидаги деформацион жараёнларни баҳолашда инновацион технологиялар. *Фарғона политехника институти илмий-техника журнали–Фарғона*, *25*(1), 139-142.
55. Axmedov I.G'., Ortiqov I.A., Umarov I.I. Effects of water flow on the erosion processes in the channel of GIS technology // https://doi.org/10.5281/zenodo.5819579
56. Холмирзаев С. А. Температурные изменения в керамзитобетонных колоннах в условиях сухого жаркого климата //Журнал «Бетон и железобетон. – 2001. – №. 2.

57. Мусина К. Х., Холмирзаев А. А. Влияние гексахлорциклогексана на внешнесекреторную функцию поджелудочной железы //Ответственный редактор. – 2014. – С. 437.
58. Хамидов А. И. и др. Использование теплоизоляционного композиционного гипса в энергоэффективном строительстве. – 2021
59. Хамидов, А. И., Ахмедов, И., Юсупов, Ш., & Кузибаев, Ш. (2021). Использование теплоизоляционного композиционного гипса в энергоэффективном строительстве.
60. Хамидов, А. И., Мухитдинов, М. Б., & Юсупов, Ш. Р. (2020). Физико-механические свойства бетона на основе безобжиговых щелочных вяжущих, твердеющих в условиях сухого и жаркого климата.