



Preface

We present to your attention the selected papers of the *International Scientific and Research Conference on Knowledge-based Technologies in Development and Utilization of Mineral Resources* held in within the framework of international specialized exhibition of mining technologies “Coal of Russia and Mining” June 1-4, 2021 (Novokuznetsk, Russia).

The conference is a traditional and recognized international platform for professional and scientific discussion of innovative geotechnologies used in the development of mineral resources and the issues connected with the industrial and environmental safety in coal mining regions.

The organizer of the conference is Siberian State Industrial University (Novokuznetsk, Russia). The co-organizers of the conference are: Federal Research Center for Coal and Coal Chemistry, Siberian Branch of the Russian Academy of Sciences (Kemerovo, Russia), VostNII Scientific Center for Industrial and Environmental Safety in the Mining Industry (Kemerovo, Russia), Scientific and Educational Center “Kuzbass” (Kemerovo, Russia), University of Science and Technology of Liaoning Province (Anshan, China), Exhibition “Kuzbass Fair” (Novokuznetsk, Russia). The event is actively supported by the Government of the Kemerovo Region – Kuzbass and administration of the city of Novokuznetsk.

The conference program included four sections:

- Geotechnology for integrated subsoil development
- Mining machines and transport systems for the mining industry
- Robotization and automation of mining processes
- Industrial and environmental safety of mining enterprises

More than 100 papers were presented in the scientific areas corresponding to the research topics of the leading domestic and foreign scientific, educational and design organizations, mining and processing enterprises, industrial safety centers.

This issue of the E3S Web of Conference contains 40 articles selected based on the results of peer review by leading scientists in the relevant scientific areas of the conference. The articles are devoted to the discussion of research work results covering the following topics: the creation and implementation of science-intensive technologies for the development of mineral deposits (referee: Dr. of Tech. Sc., Prof., V.V. Melnik, National University of Science and Technology (MISiS), Moscow, Russia), development of innovative approaches to the creation of high-performance equipment for mining industry (referee: Dr. of Tech. Sc., Prof., M.G. Rakhutin, National University of Science and Technology (MISiS), Moscow, Russia), development of automated control systems,

improvement of electrical and energy-saving mining systems (referee: Dr. of Tech. Sc., Prof., E.K. Eshchin, Kuzbass State Technical University, Kemerovo, Russia), development of technologies for complex extraction and deep processing of minerals (referee: Dr. of Tech. Sc., Federal State Institution “National Mine Rescue Center”, Novokuznetsk, Russia).

The conference program committee is headed by the Chairman V.I. Klishin, Corresponding Member of the Russian Academy of Sciences, Dr. of Tech. Sc., Prof. (Federal Research Center of Coal and Coal Chemistry at the Siberian Branch of the Russian Academy of Sciences, Kemerovo). The Deputy Chairman is L.D. Pavlova, Dr. of Tech. Sc., Prof. (Siberian State Industrial University, Novokuznetsk).

Members of the program committee are Russian and foreign well-known scientists who have made a significant contribution to the development of modern mining and processing technologies, such as S.K. Baymukhametov, Dr. of Tech. Sc., Prof. (Coal Division of ArcelorMittal Temirtau JSC, Kazakhstan), Yu.A. Veksler (Marco Systemanalyse und Entwicklung GmbH, Dachau, Deutschland), V.N. Zakharov, Corresponding Member of the Russian Academy of Sciences, Dr. of Tech. Sc., Prof. (The Institute for Problems of Integrated Development of the Subsurface of the Russian Academy of Sciences, Moscow), I.V. Zenkov, Dr. of Tech. Sc. (Special Design and Technology Bureau “Nauka” of the Krasnoyarsk Scientific Center of the Siberian Branch of the Russian Academy of Sciences, Krasnoyarsk), A.A. Eremenko, Dr. of Tech. Sc., Prof. (Institute of Mining of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk), Z.R. Ismagilov, Corr. Member of the Russian Academy of Sciences, Dr. of Chem. Sc. (Institute of Coal-chemistry and Material Science of the Siberian Branch of the RAS, Kemerovo), M.M. Mustafin, Dr. of Tech. Sc., Prof. (Saint Petersburg Mining University, St. Petersburg), O.V. Tailakov, Dr. of Tech. Sc., Prof. (VostNII Scientific Center, Kemerovo), A.V. Shadrin, Dr. of Tech. Sc., Senior Researcher (Kemerovo State University, Kemerovo), Clemens Backhaus (Fraunhofer UMSICHT, Oberhausen, Deutschland), Dr. V. Böspflug (Demeta GmbH, Deutschland).

The conference was attended by scientists from research institutes and centers, higher educational institutions, specialists from organizations and enterprises of the mining industry from cities of the Russian Federation, such as Moscow, St. Petersburg, Yekaterinburg, Krasnoyarsk, Novosibirsk, Tomsk, Kemerovo, Prokopyevsk.

Also, scientists and specialists from foreign companies from Germany, Donetsk People’s Republic, India, Kazakhstan, China took part in the conference.

The conference partners are leading scientific institutes of the Russian Academy of Sciences, Russian and foreign educational institutions of higher education and companies, world manufacturers of mining equipment, such as the Mining and Metallurgical Institute of Tajikistan (Tajikistan), Donetsk National Technical University (Ukraine), Dneprodzerzhinsk State Technical University (Ukraine), Institute for Problems of Integrated Development of Subsoil of the Russian Academy of Sciences (Moscow, Russia), Institute of Mining SB RAS (Novosibirsk, Russia), Karaganda State Technical University (Kazakhstan), Kyrgyz State Technical University named after I. I. Razzakova (Kyrgyzstan), Marco Systemanalyse und Entwicklung GmbH (Germany), Messe Düsseldorf (Germany), Special Design and Technology Bureau “Nauka” of the Krasnoyarsk Scientific Center of the Siberian Branch of the Russian Academy of Sciences (Krasnoyarsk, Russia), Technische Universität Bergakademie Freiberg (Germany), ThyssenKrupp Industrial Solutions AG (Germany).

Photos of the conference:



The Organizing Committee expresses its deep gratitude to all conference participants for an active discussion of the development of theoretical foundations and the results of the practical application of innovative methods and means of integrated subsoil development, the use of which makes a significant contribution to the development of mining science and practice.

We hope that the presented scientific articles will contribute to the creation of world-class technologies and significantly improve industrial and environmental safety in the extraction and processing of minerals.

Vice-chairman of the Organizing Committee,
Doctor of Technical Sciences, Professor V.N. Fryanov