

EURASIAN MINING

N 1 (37). 2022

**Information Journal of the Federal Educational and Methodical Association on
Applied Geology, Mining, Oil and Gas Activities and Geodesy**

FOUNDER:

"Ore and Metals" Publishing house

EDITORIAL STAFF:

S. A. Vorobev, Editor-in-Chief; L. E. Kostina, Responsible secretary; V. A. Elistratova, Editor; M. D. Matveeva, Junior editor;
N. I. Kolykhalova, Advertising manager; D. I. Vorobyeva, Responsible for pre-printing work

EDITORIAL BOARD:

V. V. Adushkin, V. J. Arens, S. S. Arzumanyan, Azim Ibrokhim, A. A. Baryah, O. S. Bryukhovetskiy, V. A. Chanturiya (Head of "Processing and complex usage of mineral resources" section), Z. J. Efendiyeva, V. A. Eremenko, L. D. Gagut (Head of "Economics and legislation" section), Zh. K. Galiev, I. I. Golovaty, P. A. Ignatov, N. O. Kaledina (Head of "Protection of labour and environment" section), D. R. Kaplunov (Head of "Deposit development" section), O. I. Kazanin, E. A. Kozlovsky (Head of "Raw material base" section), G. L. Krasnyanskiy, S. V. Krivovichev, V. S. Litvinenko, A. B. Makarov, O. N. Malgin, Yu. N. Malyshev, O. S. Misnikov, D. V. Pastikhin, V. L. Petrov (Head of "Education and staff support for the mining industry" section), G. G. Pivnyak, I. Yu. Rasskazov, U. D. Ryskulov, K. S. Sanakulov, E. E. Sheshko (Head of "Mining equipment, power supply and automation" section), V. S. Svyatetsky, A. N. Shabarov, I. O. Temkin, E. M. Titievsky, S. M. Tkach, A. F. Tsekhovoy, K. N. Trubetskoy, A. G. Tvalchrelidze, N. G. Valiev, V. A. Vinnikov (Head of "Physical processes of mining" section), Yu. I. Volkov, A. G. Vorobiev, V. L. Yakovlev, A. B. Yanovskiy, T. I. Yushina, V. N. Zakharov, B. N. Zarovnyaev, I. V. Zyryanov, V. P. Zubov

Foreign members of the editorial council:

I. B. Tabakman (Canada), L. I. Totev (Bulgaria), S. Vujic (Serbia)

Address:

Office 619, Mining Institute of National University of Science and Technology "MISiS"

Leninsky Avenue 6 bld. 2, Moscow, 119049, Russia

Phone/fax: +7 (499) 236-10-62, +7 (499) 236-11-86

E-mail: gornjournal@rudmet.ru

Internet: www.rudmet.com

Printed: "Kantsler" Printing House, Yaroslavl

Phone: +7 (4852) 58-76-33, +7 (4852) 58-76-37

Approved for printing on 28 July 2022

Volume: 12,5 printer's sheets (100 pages)

Circulation: 30 copies. The price of free.

© Design and make-up. "Ore and Metals" Publishing house, "Eurasian mining", 2022

The editorial staff do not bear any responsibility for the content of advertising materials.

Trade mark and title "Eurasian Mining" are exclusive property of "Ore and Metals" publishing house.

The journal is registered in the RF Ministry of Press (Certificate PI No. 7717550 dated 09.03.2004).

All rights reserved. This publication or parts thereof may not be reproduced in any form without permission of the publisher.

In the Scopus database edition doesn't bear responsibility for terms of placement of published articles.

ISSN 2072-0823



CONTENTS

PHYSICS OF ROCKS AND PROCESSES

- Eremenko V. A., Galchenko Yu. P., Yanbekov A. M.** Justification of new opportunities for the use of the gravitational energy of the earth in underground ore mining with convergent geotechnologies 3
- Nabatov V. V., Voznesenskii A. S.** Influence of soil–tunnel lining interface on its control by acoustic response to impulse impact 8

ECONOMY, ORGANIZATION AND MANAGEMENT

- Zhdaneev O. V.** Russian fuel and energy complex technology policy at the moment of energy transition 13

MINERAL GEOLOGY AND EXPLORATION

- Senin B. V., Mustaev R. N., Kerimov V. Yu., Leonchik M. I.** Tectonic zonality of sedimentation cover in the Black Sea–Caspian Region 20
- Kerimov V. Yu., Mustaev R. N., Senin B. V., Alieva S. A.** Modern structural and tectonic model of the Caspian Region ... 27
- Kasyanova N. A., Qiu Sh.** The structure and role of faulting and fracturing system in spatial oil saturation of rocks and in occurrence of oil reservoirs within Chezhen sag of Jiyang depression in the Bohai Bay Basin in East China 33

DEVELOPMENT OF DEPOSITS

- Oryngozhin Y. S., Bitimbaev M. Zh., Miletenko N. A., Alisheva Zh. N.** An innovative way of underground mining 38
- Rysbekov K. B., Bitimbayev M. Zh., Akhmetkanov D. K., Miletenko N. A.** Improvement and systematization of principles and process flows in mineral mining in the Republic of Kazakhstan 41

PROCESSING AND COMPLEX USAGE OF MINERAL RAW MATERIALS

- Chanturiya V. A., Bunin I. Zh., Ryazantseva M. V., Khabarova I. A.** Effect of high-power electromagnetic pulses and dielectric barrier discharges on physicochemical and flotation properties of perovskite 45
- Lavrinenko A. A., Sysa P. A., Agarkov I. I.** High-effective magnetic hydrocycloning equipment for magnetite ore processing 51
- Fedotov P. K., Senchenko A. E., Fedotov K. V., Burdonov A. E.** Influence of ore processing behavior on heap-leach cyanidation and agitation leaching efficiency 55
- Bek A. A., Yestemesov Z. A., Baidzhanov D. O., Fedotenko N. A.** Effective strengthening solutions for fractured rock masses using tailings 59

EQUIPMENT AND MATERIALS

- Sheshko E. E., Galkin V. I.** Substantiation of parameters and efficiency of sandwich belt high angle conveyors for deep open pit mines. 64
- Malakhov V. A., Tropakov A. V., Dyachenko V. P.** Rolling resistance coefficient of belt conveyor rollers as function of operating conditions in mines 67
- Bolobov V. I., Chupin S. A., Le-Thanh B.** Modeling impact fracture of rock by hydraulic hammer pick with regard to its bluntness. 72
- Muminov R. O., Kuziev D. A., Zotov V. V., Sazankova E. S.** Performability of electro-hydro-mechanical rotary head of drill rig in open pit mining: A case-study 76

POWER ENGINEERING, AUTOMATION

- Shevyreva N. Yu., Shevyrev Yu. V., Bobokin G. I.** The use of frequency converter and active rectifier of voltage for the power quality improvement in coal longwalls 80

INDUSTRY SAFETY AND LABOUR PROTECTION

- Dashko R. E., Romanov I. S.** Safety of mining in the Kupol deposit based on the analysis and evaluation of geological processes in underground mine (CHAO, Anadyr District) 85

ENVIRONMENTAL PROTECTION

- Zenkov I. V., Kiryushina E. V., Vokin V. N., Maglinets Yu. A.** Review of global trends in meeting the ecological challenges of the mining industry. Part I: International research 90

TRAINING OF PERSONNEL

- Prokopenko S. A., Ravochkin N. N., Dyagileva A. V., Shadrin V. G.** Dialectical contradictions in development and implementation of innovation intelligence potential in mining engineers 95