2015(11)5, Presidium of NAS of Ukraine 54 Volodymyrska str. Kyiv, 01601, Ukraine. S 5-13.

4. Patil, L., & Gogate, P. R. (2018). Large scale emulsification of turmeric oil in skimmed milk using different cavitational reactors: A comparative analysis. Chemical Engineering and Processing-Process Intensification, 126, 90-99.

5. Kelkar, M. A., Gogate, P. R., & Pandit, A. B. (2008). Intensification of esterification of acids for synthesis of biodiesel using acoustic and hydrodynamic cavitation. Ultrasonics Sonochemistry, 15(3), 188-194.

6. More, N. S., & Gogate, P. R. (2018). Intensified degumming of crude soybean oil using cavitational reactors. Journal of Food Engineering, 218, 33-43.

7. J. Carpenter, M. Badve, S. Rajoriya, S. George, V.K. Saharan, A.B. Pandit, (2017) Hydrodynamic cavitation: an emerging technology for the intensification of various chemical and physical processes in a chemical process industry, Rev. Chem. Eng. 33 433-468.

8. Pawar, S. K., Mahulkar, A. V., Roy, K., Moholkar, V. S., & Pandit, A. B. (2017). Sonochemical effect induced by hydrodynamic cavitation: Comparison of venturi/orifice flow geometries. AIChE Journal.

9. Carpenter, J., Badve, M., Rajoriya, S., George, S., Saharan, V. K., & Pandit, A. B. (2017). Hydrodynamic cavitation: an emerging technology for the intensification of various chemical and physical processes in a chemical process industry. Reviews in Chemical Engineering, 33(5), 433-468.

10. Gireesan, S., & Pandit, A. B. (2017). Modeling the effect of carbon-dioxide gas on cavitation. Ultrasonics sonochemistry, 34, 721-728.

11. Sreedhar, B. K., Albert, S. K., & Pandit, A. B. (2017). Cavitation damage: Theory and measurements–A review. Wear, 372, 177-196.

12. Jadhav, N. L., Sastry, S. K. C., & Pinjari, D. V. (2018). Energy efficient room temperature synthesis of cardanol-based novolac resin using acoustic cavitation. Ultrasonics Sonochemistry, 42, 532-540.

OBJECTIVE LAWS OF ROCK PRESSURE CHANGE IN FRONT OF ADVANCING LONGWALL FACE

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Purpose. To develop a method for determining the increase in stress above advancing longwall face in conditions of Western Donbas mines.

Methodology. The investigation was carried out with application of mine surveying instrumental observations in boreholes and on the Earth's surface.

Findings. During extraction of coal seams the area of high rock pressure is formed around the boundary of the gob, which spreads into the roof and the floor

of the seam. The distance at the selvedge of the extracted seam where the high rock pressure manifests is called the width of abutment pressure zone and is denoted by l. The value of l depends on the depth of mining and the extraction height of mined seam and is the main initial parameter for designing of high rock pressure zones. The existing methods of l determination give a variation in the prediction of this value up to 100% for the same conditions. The methods for assessing the quantitative parameters of the rock pressure increasing at the selvedge of the extracted seam have not been proposed yet. In this paper, the objective laws of distribution of rock pressure incremental values are considered on the results of mine surveying instrumental observations in boreholes and on the Earth's surface. A method for determining the increment ratio of stress in rock mass above the advancing longwall face in conditions of the Western Donbas mines is proposed and is confirmed by other investigations.

The paper contains the results of research that was conducted under the project №050128/10-11/4677-U.

Keywords: subsidence, abutment pressure, strain, rock, undermining, benchmark, borehole extensometer.

References

1. Управление кровлей и крепление в очистных забоях на угольных пластах с углом падения до 35º. Руководство КД 12.01.01.503-2001 / [Е.Д. Дубов, В.И. Ефремов, А.М. Ковтун и др.] – ДонУГИ, 2002. – 141 с.

2. Расположение, охрана и поддержание горных выработок при отработке угольных пластов на шахтах / Руководящий нормативный документ. – Мінпаливенерго України. – 1998. – 148 с.

3. Правила охраны сооружений и природных объектов от вредного влияния подземных разработок на угольных месторождениях. – [Действующий от 1979–12–29]. – М.: Недра, 1981. – 288 с.

4. Кучин А.С. Сдвижение массива горных пород в Западном Донбассе / А.С. Кучин // Проблеми гірського тиску. Збірник наукових праць. – Донецьк: ДонНТУ. – 2011. – Вип.19 – С.38-61.

5. Kuchin O.S., Chemakina M.V., Balafin I.E. Displacement / O.S. Kuchin, M.V. Chemakina, I.E. Balafin // Scientific Bulletin of National Mining University. - 2017. - №. 155-60.

6. Мониторинг состояния выработок в зонах ПГД глубоких шахт ОАО «Павлоградуголь» и разработка рекомендаций по поддержанию выработок в этих зонах / Отчет по НИР №050128 /10-11/ 4677-У.

7. Халимендик Ю.М., Назаренко В.А., Бруй А.В., Заболотная Ю.А. Исследование деформирования сечений выработок, поддерживаемых на отработанных участках. Проблеми гірського тиску. – Вип.18.– Донецьк, ДонНТУ, 2010. С. 104-115.