

## SUBSTANTIATION OF MUD PREPARATION TECHNOLOGY

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**Purpose.** To study the advantages of hydrodynamic cavitation, to calculate the frequency of cavitation oscillations by the device parameters, to obtain a formula for determining the dispersion time of the material, and to study the flow of the drilling fluid in the device using the SolidWorks program.

**Methodology.** The studies were carried out by justifying the operation parameters of a cavitation generator using hydrodynamic methods and SolidWorks.

**Findings.** As a result of theoretical and experimental research, a technology for preparing stable finely dispersed washing fluids has been developed using hydrodynamic effect of super-cavitation. The dispersion time is inversely proportional to the number of cavitation bubbles in the flow (the frequency of cavitation oscillations) produced per unit time. The hydrodynamic super-cavitation that occurs when the fluid flows around axisymmetric bodies has been justified to be the most promising technology in terms of energy efficiency for the preparation of washing fluids. A new design of cavitation disperser has been developed; its novelty has been certified by patent of Ukraine. The flow choking coefficient  $k_c$  is the key controllable parameter influencing the intensity of cavitation treatment. The cavitation disperser enables the effective dispersion of washing liquid components and can be commercialized in the drilling practice. The most rational value of the locking factor (from the point of view of minimum hydraulic resistances) for the operation of the cavitation disperser is in the range 0,6-0,8. On the basis of theoretical studies, it was established that the dispersion time of the disperse phase for a single treatment cycle is inversely proportional to the frequency of cavitation oscillations.

They contain the researches, which were conducted within the project GP – 395, financed by Ministry of Education and Science of Ukraine.

**Keywords:** well drilling, well, dispersion method, cavitation, washing liquid, hydrodynamic super-cavitation, cavitation disperser.

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## **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