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THE THEORY OF FLOTATION. DETERMINATION OF SUFFICIENT TIME FOR FLOTATION PROCESS, FEATURES

Mineral complexes are air bubbles, on which the mineral particles are fixed. In distributive environments, complexes are subjected to various forces, so they are exposed to the environment at a certain speed. The totality of forces is divided into two groups, these are the forces acting in the direction of the movement of the complexes to the zone of the environment and the forces opposing the recovery of the complexes, that is, the forces of resistance.

The flotation process is possible if the particles of useful knees and air bubbles under the action of applied energy are placed throughout the volume of the flotation apparatus. These costs are for current fluids, so the trajectory of ascent and the speed of the complexes is enormous.

The general initial formula for determining the rate of confusion of the complex is as follows:

$$\upsilon_k = \frac{F_p}{F_c}, \qquad (1)$$

where F_p – is the resulting subnaminal force, N; F_s – factor that causes resistance to glass movement, kg/s.

In the process of solving this problem, the indicated patterns of forces should be divided into two.

One of the component goals is subject to a large difference in the target components, that is, the environment and, however, flotation complex, air bubble – a mineral.

The second component is the energy state of the environment.

At this stage of the development of the theory of native environments, their condition is determined by the indicator – «turbulence».

n this paper, the whole complexes are considered in a solution that is in a «state of tranquility».

The resulting force is trained by the mutual efficiency of the airborne blasting force and the mineral frequencies that are being treated for its purification. To determine these forces we will use the law of Archimedes.

Lifting force for air bubble:

$$F_п = V_п q(\delta_{пп} - \delta_в)\,, \tag{2}$$

where V_r – volume of air bubble, m^3; δ_{rr} – density of the pulp (sludge) – medium, kg/m^3; δ_a – air density, kg/m^3; q – gravitational acceleration, m/s^2

Lifting force for mineral particles:

$$F_ч = V_ч q(\delta_{пп} - \delta_ч)\,. \tag{3}$$

where $V_ч$ – amount of particles of minerals that are fixed on the bubble, m3; δ_{nn} – density of the pulp (sludge) – distribution medium, kg/m^3; δ_{nn} – density of particles – minerals, kg/m3; q – gravitational acceleration, m/s^2.

Taking into account the values of the forces determined by formulas (2) and (3), an equal power:

$$F_p = V_п q(\delta_{пп} - \delta_в) \pm V_ч q(\delta_{пп} - \delta_ч)\,. \tag{4}$$

The formula (1) for determining the speed of motion taking into account (4) is as follows:

$$F_p = V_п q(\delta_{пп} - \delta_в) \pm V_ч q(\delta_{пп} - \delta_ч)\,. \tag{5}$$

In the formula (1) and (5), the unit of measurement *Fs* is set to the inverse principle, that is, if the size of the left part is from 1 to 5 m/s, then on the basis of the theory of the size of the factor of the resistance *Fs* is the value of kg/s, that is, that another as a counter stream of mass

In this case, in the general form for the determination of Fs it is right to write:

$$F_c = k(Q_\mu + Q_\delta)\,, \tag{6}$$

where Q_μ, Q_δ – the supports are due to the reverse mass flows, according to which water, the solids content in the aquatic environment.

Reverse mass flow due to the environment:

$$Q_\mu = f(\mu \cdot d)\,, \tag{7}$$

where μ – viscosity, kg/(m s); d – size (diameter) of the complex, m.

In explicit form, determined on the basis of the dimension theory:

$$Q_\mu = f_\mu(\mu \cdot d)\,. \tag{8}$$

where f_μ – is a numerical coefficient.

The reverse mass flow, due to the content of solids, or others included in the environment in a functional way, is as follows:

$$Q_\delta = f_\delta(\delta \cdot \nu \cdot d_ч)\,, \tag{9}$$

where f_δ – numerical coefficient; ν – kinematic viscosity, m^2/s; this is the diameter of the particles contained in the medium, m.

In explicit form:

$$Q_\delta = f_\delta(\delta \cdot \nu \cdot d)\,. \tag{10}$$

The coefficients k, f_μ, f_δ are determined using an active experiment.

The proposed method for determining the complexity mating is carried out by practically all the determined factors, so the speed is determined in such a way that it coincides with the values of the speed determined for the experiment.

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