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GAS BALANCE OF MUD VOLCANOES

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Abstract. Gas accumulating at the roots of mud volcanoes is one of the most important factors, which promotes the occurrence of mud volcanoes and their activity. Alongside with a heat allocated from bowels of the Earth and in addition raising its pressure, it serves as a working body in this original natural thermal machine as a mud volcano. Therefore, finding - out of the reason of occurrence and activity of mud volcanoes in feature is very important for calculating more precisely their gas balance.

In connection with above, the author calculated the minimal energy which necessary for eruption of volcano. Proceeding from the geometrical sizes of the existing mud volcanoes described in the literature, it equals to ~ 2,2 * 10^{14} J. For comparison: capacity of the nuclear bomb equivalent to 20 kTn of troy makes 8,4 * 10^{13} J, i.e. even the quantity of minimal necessary allocated energy for eruption of a volcano is approximately 2,6 times more, than at explosion of a nuclear bomb.

From the energy necessary for break of a fuse of mud volcano the minimal depth of their roots was designed. It was equal 6,06 km (for a case when the gas is filtered and accumulated directly under a fuse).

Executed accounts of dynamics of eruption process, taken into account of solubility of natural gas into mud volcano's water, permeability of mud volcano's breccia for gases, the reasons of ignition of mud volcano's gases at eruption (in particular the temperature of ignition) and other factors allow to assume that the real depth of roots of mud volcanoes is not less than 15 km. Proceeding from pressure at this depth (" 3800 bar) and dynamics of its fall during the process of reduction of a breccia's column above gas, the minimal volume of gases allocated at eruption of Lokbatan volcano in 1887 and 1957 was calculated. Calculation was made taken into account that circumstance, when the quantity of gas allocated at eruption basically, is defined by its spending G through the eruptions muzzle with the area of section S, speed *v* during time *t* under concrete conditions. The volume of gases was ~ 2,9 *10^{7} m^{3}, and their average speed of leaking from the muzzle of a volcano - 530 m / s. In summary, we would like to note, that executing of calculations on other volcanoes located in territory of Azerbaijan, will allow to estimate the volume of gases allocated at eruption of these volcanoes, and to calculate the stocks of gas in their bowels taken into account the periodicity of their eruption. It is especially important for an estimation of volume of gases of sea mud volcanoes where the direct measurement methods of quantity of allocated gases are absent, but indirect - are inexact.