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INVESTIGATION OF THE FOAMING PROCESS DURING DECOMPOSITION OF LOCAL DOLOMITE GAITERS AND IN SULFURIC ACID

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Uzbekistan has the richest reserves of magnesium-containing raw materials, which include chloride-sulfate brine of lakes Karaumbet and Barsakelmes, dry mixed salts of Lake Karaumbet, dolomite deposits scattered throughout the republic, such as Navbakhor, Shursu, Karnab, Ketmontazh, Dehkanabad, astrakhanite of Akkalinsky and Kukanatau deposits and others. Despite the availability of a raw material base, they are not being developed due to the lack of acceptable, economically sound technical solutions for their processing [1, 2].

The initial raw materials for the production of magnesium oxide are minerals - carnallite ($KCl•MgCl_2•6H_2O$), magnesite ($MgCO3$), dolomite ($MgCO3•CaCO3$), bischofite ($MgCl_2•6H_2O$), kieserite ($MgSO_4·H_2O$), kainite ($KCl•MgSO_4•3H_2O$), langbeinite ($K_2SO_4•2MgSO_4$), epsomite ($MgSO_4•7H_2O$) and kiserite $MgSO_4•H2O$ [3].

During the decomposition of the Krestyanin dolomite, the effect of acid concentration and the duration of the decomposition process on the binding of the PAA gel under the influence of the chemical composition of the cellulose mass, liquid and solid phases was studied 20, 25, 30, 35, 40, % Sulfuric acid in the amount is 110% of the stoichiometry.

This figure shows the curves characterizing the foaming process during the single-stage sulfuric acid decomposition of dolomite raw materials. The temperature of the decomposition process is 50 °. The experimental data obtained show that the foam multiplicity (the ratio of the total height of the pulp and foam to the height of the pulp) of the PAA-gel effect increases with an increase in the concentration of sulfuric acid.

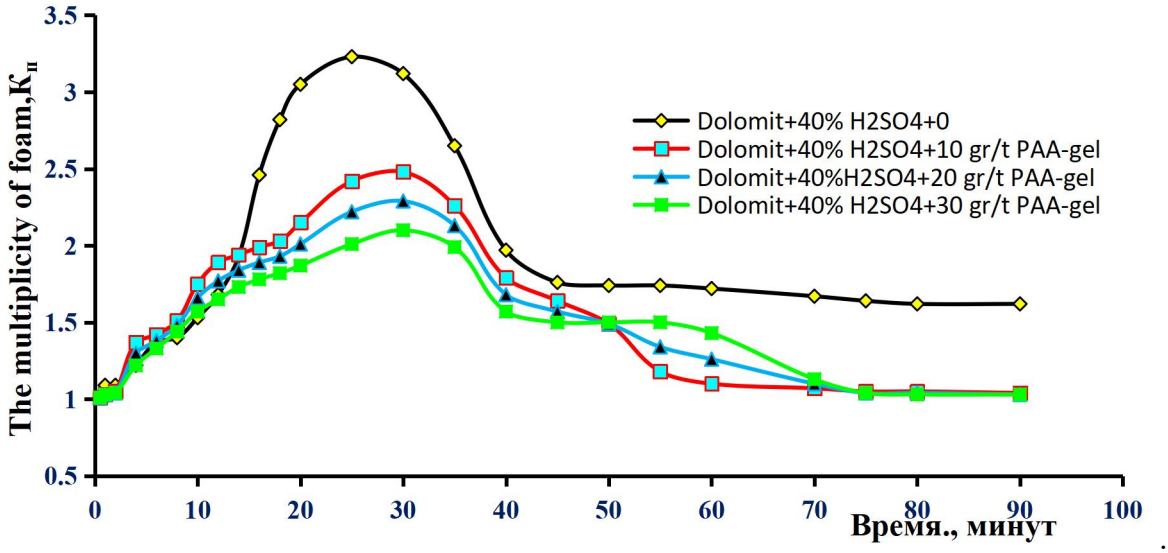

Fig. Diagram of the effect of time and PAA-gel on the foam multiplicity during decomposition of dolomite raw materials with sulfuric acid

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For example, when decomposing dolomite raw materials from the norm of sulfuric acid 110% stoichiometry at concentrations of 40%, the multiplicity of the resulting foam sharply increases by an average of 24%, respectively. This is due to the maximum rate of decomposition of the carbonate part of the dolomite under these conditions.

With an increase in the acid concentration from 20 to 40% in the entire range of the defoamer, the foam multiplicity increases slightly by an average of 1.97%. With a further increase in the concentration of sulfuric acid, the foam multiplicity practically does not change, which is explained by a decrease in the supersaturation of the reaction medium with the released gas due to an increase in the amount of the liquid phase.

The conducted studies have confirmed the need to solve ways to reduce foaming during the sulfuric acid decomposition of high-carbonate dolomites for the normal implementation of the technology for obtaining sulfur-magnesium fertilizers.

The results of the study allowed us to conclude about the nature of the acid decomposition process. Sufficiently high values of the degree of decomposition of dolomite correspond to the achievement of pH values of the suspension in the range 0-1.5.

Accelerate the process of sulfuric acid decomposition of local dolomite raw materials and study its processing into MgSO4, MgO, liquid and granular magnesium fertilizers. The effect of surfactants on the multiplicity of foam formed during decomposition of dolomite raw materials has been studied. As a result, an increase in the filtration rate and a decrease in the foaming rate were achieved.

List of literature:

1. A. N. Gavrilyuk, O. B. Dormeshkin, G. H. Cherches Physico-chemical features of acid decomposition of dolomite Proceedings of the National Academy of Sciences of Belarus, Chemical Series, 2021, issue 57, no. 1, pp. 109-118.
2. Mikhliyev O. A. Development of technology for complex processing of dolomite with nitric acid to produce magnesium compounds and liquid fertilizers//Diss... sois. uchen. step. Doctor of Phil. (PhD) of technical sciences. Tashkent, 2019. 115 p.
3. Shand M.A. The Chemistry And Technology Of Magnesia. – John Wiley&Sons, Inc. 2006. – 191p.