



INCREASING THE PRODUCTIVITY OF WELLS BY USING THE METHODS OF INFLUENCE ON THE WELL TUBE

1Abdirazakov Akmal Ibrahimovich

Docent of ispolnyayushchi obyazannosti, Karshinsky Engineering and Economic Institute, city Karshi, Republic of Uzbekistan e-mail : akmal / abdirazakov @ bk . ru,

2Ibotov Oybek

Corner with a house senior lecturer, Karshinsky Engineering and Economic Institute, city Karshi, Republic of Uzbekistan.

3Jumaev is the son of Doston Bakhtiyar

Student group NGI-122-21 Karshinsky Engineering and Economic Institute, city Karshi, Republic of Uzbekistan.

https://doi.org/10.5281/zenodo.7353283

ARTICLE INFO

Received: 14th November 2022 Accepted: 20th November 2022 Online: 24th November 2022

KEY WORDS

Wellbore, acid, hydrochloric acid, porosity, suppression, formation, permeability, extraction, carbonate, reservoir.

ABSTRACT

This article mainly focuses on acid treatment, which is one of the mechanisms of increasing the permeability and porosity of the surrounding layers of the wellbore by influencing the wellbore.

" Shortanneftgaz" LLC, and in 2017, 21 oil and gas, gas condensate fields were used for production, of which: 7 fields (Shortan, South Tandırcha, Buzakhur, Eastern Buzakhur, Chunag'ar, Ogdin, Tarnasog ) in the production of gas and gas condensate, in the production of oil from 8 fields (Garby Tashli, Shirky Tashli, Harmiston, Yakkasarog, Garbiya Yakkasarog, Feruza,

Mangit, Ruboyi) and from 6 fields (Shimolig Shu'rtan, Yangi Karatepa, Tortsari, Ilim, Sherkent, Koratepa) was used in the production of oil, gas and gas condensate In addition, in 2017, 4 fields belonging to the Chigil group (Shimolig Girsan, Devkhana, Ernazar and Nazar well) were used for the production of gas and gas condensate.

MAIN PART

Table with 5 columns: No, Term, Number of wells, Acid percentage and amount, Amount of extra gas taken. It contains two rows of data regarding acid treatment results in January and February.



3	In March	8 (#172, 201, 251, 15, 119, 194, 154, 139).	20 - 22% sol.acid content 32 tn	60 thousand m <sup>3</sup> / day
4	In May	18 (#127, 128, 174, 175, 303, 195, 196, 141, 184, 108, 96, 51, 53, 55, 61, 193, 190)	20 - 22% sol.acid content 89 tn	128 thousand m <sup>3</sup> / day
5	In July	5 (#83, 84, 233, 129, 219)	20-22% sol.acid content 26 tn	24 thousand m <sup>3</sup> / day
6	In August	4 (#173, 125, 102, 140)	20-22% sol.acid content 16 tn	14 thousand m <sup>3</sup> / day
7	In September	2 (#145, 179) .	20-22% sol.acid content 6 tn	10 thousand m <sup>3</sup> / milk,
9	In October	5 (#103,160,182,52,2) .	20-22% sol.acid content 22 tn	20 thousand m <sup>3</sup> / day,
10	In November	7 (#207, 202, 252, 137, 171, 57, 157) .	20-22% sol.acid content 17 tn	36 thousand m <sup>3</sup> / day
11	In December	2 (#211,198)	20-22% sol.acid content 8 tn	12 thousand m <sup>3</sup> / day

Table 1 provides information on the work carried out to increase the productivity of gas utilization wells at the Shortan field belonging to "Shortanefgaz" MCHJ .

**Information about the work carried out to increase the productivity of gas field exploitation wells belonging to "Shurtanneftgaz" MCHJ.**

**Table 1**

No t/r	No wait	Coefficient of creep resistance		working pressure, kg/ cm <sup>2</sup>		Average daily production, thousand.m <sup>3</sup> /k.k.		Additional gas production thousand .m <sup>3</sup> / k.k.	HCL 13% consumption , tn
		"a* " before processing	After processing " a*"	Before processing	After processing	Before processing	After processing		
1	2	6	7	8	9	10	11	12	13
<b>Sh ortan mine</b>									
1	101	19.78	6.68	37.98	39.78	178	186	8	4
2	71	8.94	4.24	44.12	45.79	253	263	10	4
3	72	9.20	4.14	42.15	43,45	242	249	7	4
4	3	9.82	5.33	39,42	40.15	224	228	4	4
5	168	9.29	4.57	38,12	39.78	217	227	10	4
6	13	13.65	4.22	38.45	39.78	181	187	6	4
7	110	12.03	4.97	52,62	53.98	198	204	6	4



8	5	19,24	5.34	39,30	40.89	225	235	10	4
9	86	13.02	6.37	39.86	40.89	150	154	4	4
10	267	16.77	6.10	40,45	41.55	190	195	5	4
11	210	13.42	4.40	45.20	46.10	214	218	4	4
12	92	17.79	3.40	39.50	41.56	225	237	12	4
13	197	12.93	4.98	40.25	42.28	189	198	10	4
14	208	13.35	4.86	45,52	48.53	213	228	15	4
15	244	12.53	5.89	39.45	40,48	116	119	3	4
16	266	13.38	4.86	39.56	40.55	186	191	5	4
17	144	15.25	6.29	40.16	41.53	189	195	6	4
18	264	15.47	5.32	39,40	40.78	185	192	7	4
19	172	14.91	6.39	37,41	38,42	176	181	5	4
20	201	13,24	5.67	40.25	41.30	231	237	6	4

## Methodology

At first, the method of acid treatment of the well was used only in reservoir deposits made of carbonate rocks, but later its application became more widespread.

A) processing in order to increase the flow rate of wells in carbonate rocks and reservoir deposits containing carbonate.

B) acid treatment around the bottom of the well in order to increase the acceptability of the driving wells.

C) processing for the purpose of dissolving salt layers.

G) paraffin - thermal acid treatment to remove tar residues from pores.

Hydrochloric acid processing is based on the dissolution of carbonate rocks by hydrochloric acid. This reaction proceeds as follows:

A) for limestone:  $2\text{HCl} + \text{CaCO}_3 = \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$

B) for dolomite:  $4\text{HCl} + \text{CaMg}(\text{CO}_3)_2 = \text{CaCl}_2 + \text{MgCl}_2 + 2\text{H}_2\text{O} + 2\text{CO}_2$

$\text{CaCl}_2$  and  $\text{MgCl}_2$  formed as a result of the reaction dissolve well in water and are easy to remove from the well. Currently, there are the following types of acid treatment:

1. acid bath.
2. simple acid treatment.
3. acid treatment under pressure.
4. heat chemical and hot acid treatment.

The purpose of acid bath treatment is to clean the surroundings of the well bottom from contaminants (cement or log debris and corrosion products). The acid bath method differs from other methods in that the acid solution is taken through the thickness of the productive layer and is not affected by pressure.

The simple acid treatment method is one of the most common methods. It is designed to clean porosity by pumping acid around the bottom of the well, which is done using a single pump unit. 20 – 35 m<sup>3</sup> of acid solution is required for processing in the normal acid treatment method.

The difference between acid treatment under pressure and the normal method is that it is treated under high pressure (200, 250, 300 kgs/cm<sup>2</sup>).

The effect of processing depends on acid concentration, its amount, pressure, temperature, description of the rock, etc.



It is effective to treat the bottom of the well with an 8-15% salt-acid solution. As a result of treatment with a highly concentrated salt acid solution, it affects the strength of well equipment and causes them to quickly fail. Reaction with gypsum creates residues in pores. Low concentration salt causes difficulties in processing with acid solutions to obtain more amount of acid solution and to extract the results of the reaction. An acid solution with a concentration of 8-15% in a volume of 0.4-1.5m<sup>3</sup> is needed for processing 1m thick.

acid solution in the volume of 0.4-0.6m<sup>3</sup> is used in the treatment of a layer formed from a low-permeability collector and a low-flow well. An acid solution in the volume of 0.8 - 1m<sup>3</sup> is used for highly conductive layers. Acid solution in the volume of 1-1.5m<sup>3</sup> is used for wells made of highly permeable rocks and with a high initial discharge.

In wells with low formation pressure, it is necessary to treat with 10-12% hydrochloric acid solution. In high-pressure wells, treatment with 12-15% hydrochloric acid gives better results, and 8% acid solution is used for treatment of carbonate sandstone layers.

Hydrochloric acid used in downhole treatment erodes well equipment. Inhibitors are added to prevent this. Formalin is used as an inhibitor. Adding 6 kg of formalin to one ton of acid solution reduces the corrosion activity of the solution by 7-8 times.

The most common inhibitor - unicol RV - 5 is a brown colored liquid, when 0.25-0.5% unicol is added, it reduces the corrosion activity by 31-42 times. Unicol completely dissolves in hydrochloric acid, but does not dissolve in water, therefore, after the

reaction, when the acid solution is converted to CaCl and MgCl, a residue remains from it, this is its disadvantage, so if it is added in a very small amount of 0.1%, it will reduce its corrosion activity up to 15 times.

In addition to the above-mentioned inhibitors, I-I-A and uratropin mixture and UFE<sub>8</sub> are used.

Intensifiers, i.e. surfactants, are added to increase the effectiveness of processing.

When surfactants such as OP-10 UFE<sub>8</sub> carbozalin O, katapin and katamine are added, the reaction of acid with carbonates decreases 3 times.

Hydrochloric acid is produced in a high concentration in the factory, and it is mixed with water to the desired concentration in order to use it in this case.

4 different types of hydrochloric acid are produced:

1. Synthetic technical hydrochloric acid;
2. Technical hydrochloric acid;
3. Hydrochloric acid prepared from organic gases;
4. The plant contains hydrochloric acid.

In salt-acid well treatment, the acid solution is prepared in the central acid base or around the well being treated. To do this, add acetic acid and, if necessary, hydrofluoric acid, from the amount of water indicated in the table, and put it in a measuring container. The amount of acid calculated according to Kegin's instructions is placed in a container over water and mixed thoroughly. The concentration of the solution is checked by density, and if water is low, water is added, if acid is low, acid is added. Add NaCl to the yeast solution and stir until it is mixed. After 5 minutes of



mixing, the intensifier is added and the solution is ready for use.

Yes dashing process can be divided into 3 stages, first buffer liquid injection, then solution injection and layering. After the

acid has been injected into the well, it is left undisturbed for several hours. The acid retention time according to pressure is given in table 2 below.

**2 - table .**

Pressure Mn/m <sup>2</sup>	Pressure kgs/ cm <sup>2</sup>	Catch time hour
up to 0.7	up to 7	3.6
up to 0.7	From 7 to 10	12-24
From 2.0 to 6.0	From 20 to 60	30

## CONCLUSION

In impacting the bottom of the well, it is possible to carry out the study of the structural and geological structure of the

rocks around the bottom of the well, to achieve the desired results from the impact, and to use the raw materials and labor force rationally.

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