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DEVELOPMENT INHIBITOR FOR SALTY ACID PROCESSING THE BORE HOLES

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Abstract: *In the article are described the protective effect of different corrosion inhibitors. The possibilities of reducing the corrosiveness of hydrochloric acid were studied.*

Keywords: *Carbonate rock, inhibitor, anticorrosion activities, corrosion, hydrochloric acid, acrylic emulsion, formaldehyde, bore hole, salts copper.*

Currently open and using row of gas deposits in Central Asia, including in Uzbekistan presented carbonate rock and having high stratum temperature.

Undertaking the work on intensification with using the salt acid is complicated raised corrosion of the equipment and pipes on bottom hole of bore holes. Applicable at present anticorrosion inhibitors of the hydrochloric acid of the type unikol, GB-5, V-2 and others are not enough efficient.

Best protection inhibitors provide at the temperature below 50-60^{0}C. Cooling bottom hole and steam of the bore hole before specified temperature does not present the technical difficulties and so study anticorrosion activities inhibitor was conducted at importance's of the temperature before 90^{0}C. In this connection, experimental work on study of the velocities of the corrosion St 20 in ambience 12% of the hydrochloric acid, inhibited with different inhibitor and their mixture are organized at the temperature from 20^{0}C till 90^{0}C.

Concentration hydrochloric acid, quantity of it's in per unit surface of the sample, duration of the experiments were constant. The experiments were performed at atmospheric pressure. Thus, when the pressure increases the corrosion rate decreases, a certain amount of corrosion is slightly overestimated against actual, and it allows you to have some margin when assessing the protective action of the inhibitors.

Studied protective effect of the following inhibitors and their mixture:

1) «SUMONO-extra-M» (0,8*).
2) («SUMONO-extra-M») (0,4) acrylic emulsion (0,4%).
3) Acrylic emulsion (0,6%), methenamine (0,3), formalin(0,1%).
4) Gocciolava resin (0,5%), thiourea (0,3%), salts copper(0,2%).

*In parentheses are shown the weight percent of inhibitor added to 12 % of hydrochloric acid.

It should be noted that only those investigated urgently inhibitors of hydrochloric acid corrosion, which have a raw material base and are not scarce. In addition, studied the possibility of reducing the corrosiveness of hydrochloric acid by emulsification it's in hydrocarbon environment.

On fig.1 is shown dependency of the rate Ct.20 of the corrosion on temperature for 12% hydrochloric acid and hydrochloric acid inhibited with «SUMONO-extra-M». On fig.2 is shown that under 90^{0}C rate of the corrosion Ct.20 in ambience hydrophobic emulsions 12% of HCl – nefras phases 75/25 decreased in four times in contrast with rate of the corrosions in ambience 12% of HCl with «SUMONO-extra-M» under the same temperature. From fig.2 it is seen that for the temperature from 20^{0}C till 70^{0}C the most efficient is an inhibitor «SUMONO-extra-M» with acrylic emulsion. Under 90^{0}C factor of the corrosion Ct 20 in ambience 12% of the hydrochloric acid with inhibitor «SUMONO-extra-M» is 130 g/m^2·hour, but with inhibitor «SUMONO-extra-M» with acrylic emulsion, approximately 38 g/m^2·hour. In contrast with inhibitor «SUMONO-extra-M», composition consisting of «SUMONO-extra-M» with acrylic emulsion possesses beside advantage the main from which is that last does not litter bottom zone of the layer when processing.

When use mixture inhibitor «SUMONO-extra-M» - a formaldehyde + methenamine occurs

the sharp reduction corrosion activities of the hydrochloric acid. The factor of the corrosion (in g/mg^2·hour) under 70^{0}C is 1,9 and under 80^{0}C – 3,6 and under 90^{0}C -7.

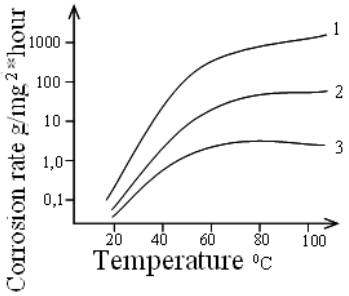

Fig.1. Dependency of the rate of the corrosion HCI(1), HCI with «SUMONO-extra-M»(2), HCI with «SUMONO-extra-M» +acrylic emulsion(3).

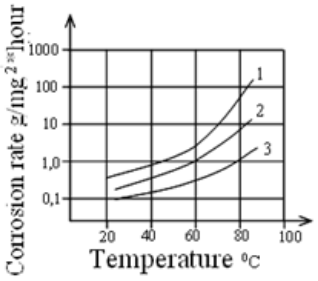

Fig.2. Dependency of the rate of the corrosion Ct. 20 from temperature in witness of HCl with «SUMONO-extra-M»(1) of the emulsion HCl with nefras (2) «SUMONO-extra-M» with methenamine and formalin(3)

Thereby, accompaniment methenamine and formaldehyde under 90^{0}C, corrosion falls in 20 times in contrast with corrosion by activity of the hydrochloric acid inhibited with one «SUMONO-extra-M».

From fig.3 it is seen, as possible reduce the corrosion activity of the hydrochloric acid, inhibited with «SUMONO-extra-M»: accompaniment of methenamine in amount 0,2% (the curve 2), as well as mixture methenamine and gocciolava resin (the curve 3).

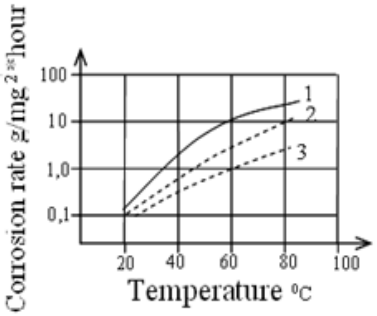

Fig.3. Dependency of the rate of the corrosion Ct 20 from temperature in witness of HCl with «SUMONO-extra-M» (1), HCl with «SUMONO-extra-M» with methenamine(2) and HCl with SUMONO-extra-M» + gocciolava resin (3)

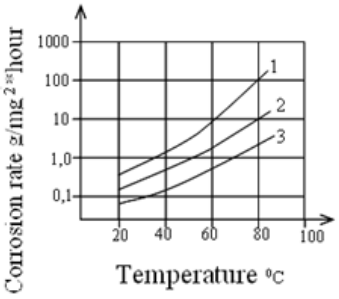

Fig.4. Dependency of the rate of the corrosion dependence of temperature in presence HCI with «SUMONO-extra-M», (1) HCI with «SUMONO-extra-M» + gocciolava resin (2); HCI with «SUMONO-extra-M» + thiourea +salts copper.

Under 70^{0}C with use the salt acid mixture inhibitor «SUMONO-extra-M» and уротропина. The rate of the corrosion became in four times less, than rate corrosion in ambience 12% of the hydrochloric acid inhibited with «SUMONO-extra-M», but use mixture inhibitor of the corrosion seven times in contrast with HCI inhibited only with «SUMONO-extra-M».

From fig.4 is seen that «SUMONO-extra-M» with gocciolava resin, thiourea and salts copper wholly can be used as inhibitor hydrochloric acid corrosion under high temperature.

Thereby, possibly do conclusion on results from experimental studies multicomponent compositions are an efficient inhibitor for hydrochloric acid processing the bore holes.

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