

260. An inaccurate report can do more harm than good.

For example, a weight loss reading indicates that you lost .40 mpy (mils per year) and you accidentally recorded it as 40 mpy. Seeing this number, the corrosion engineer decided to treat the well immediately with an inhibitor. This may be an unnecessary expense to the company because the well might not really need the _____.

261. Since you, as the operator, work closest to the equipment, it is important for you to report any known corrosion.

This may reduce costly down-time or replacement of equipment due to _____.

Instructions For Use:

SCALE AND PARAFFIN PROBLEMS

262. When monitoring corrosion, it is important to remove any paraffin or scale that has formed.

These substances (increase / decrease) the accuracy of the monitoring techniques.

263. Both paraffin and scale can block pipelines and _____ flow or production.

264. They also cause problems when trying to monitor corrosion because they may _____ corrosion damage.

265. In a similar manner they may coat probes, etc. which would reduce measuring _____.

266. These layers will also prohibit effective treatment. If the chemicals cannot reach the metal, the chemical (will / will not) work.

267. Both of these problems cause other difficulties as well at the lease and are often being chemically controlled for those reasons.

It is important, however, to remember that if paraffin or scale are present, they will affect corrosion monitoring and _____.

EQUIPMENT MONITORING

268. Different types of equipment require different types of monitoring.

For instance, very little oxygen gets into a gas-condensate well. Therefore, you (need to monitor / do not need to monitor) for oxygen.

269. Most often, iron counts or water _____ are taken.

270. If you are monitoring a sour system, you can use a _____ probe because of the hydrogen present in the system.

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271. With most types of oil wells, either pumped or flowing, just about any method of monitoring is acceptable.

Along with the various types of corrosion, you would monitor for (scale / paraffin) as well.

272. But, equipment with high levels of water, such as water supply tanks or disposal tanks, are monitored differently than oil wells.

For example, you (will/ will not) need to check for scale deposits.

273. Oxygen also (is a problem / is not a problem) in water systems.

274. You will also need to monitor for sulfide reducing _____ .

275. Therefore, when choosing a monitoring system, the advantages and disadvantages must be considered, along with the produced fluids and _____ involved.

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CONTROL MEASURES

CHEMICAL TREATMENTS

276. From the previous section, you learned that chemicals were used to treat _____ and _____ .

277. There are also chemicals to control corrosion. They are called inhibitors.

As you recall, the movement of ions is the basis of the _____ reaction.

278. When the ions and electrons cannot move freely, corrosion is reduced or _____ .

279. Therefore, inhibitors control corrosion by (removing ions from solution / restricting movement of ions and electrons).

280. They do this by forming a *protective* film on the anode and cathode. The film isolates the anode and cathode from the electrolyte. Remember, in order for corrosion to occur both the anode and cathode must be in _____ with the electrolyte.

281. Inhibitors are added to the water, or other fluid in the system, to _____ corrosion.

282. These chemicals do not react with the fluid. Instead, the film that is formed normally lasts several days to a week. Inhibitors provide (short-term / long-term) protection.

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ANSWER MASK

283. Therefore, chemical inhibitors are (permanent / temporary).
284. As a result, these inhibitors need to be replenished on a _____ basis.
285. Another type of chemical treatment is a **neutralizer**.
Unlike an inhibitor, a neutralizer does react with the _____ .
286. An acidic solution, as you recall, is corrosive. A neutralizer reduces corrosion by _____ the acid solution.
287. As with an inhibitor, neutralizers are also (temporary / permanent).
288. So, once the neutralizer has gone through the system, corrosion (may occur / will not occur) again.
289. Therefore, neutralizers must be used (continuously / periodically) to prevent corrosion.
290. In addition to acidic solutions, you remember that microorganisms can also (cause / prevent) corrosion.
291. **Bactericides** are another type of chemical treatment.
Bactericides react with the fluid and kill the _____ .
292. As you recall, many microorganisms produce a sulfide. So, by eliminating the sulfide producing bacteria, this will also reduce the amount of (iron sulfide / hydrogen sulfide) in the system.
293. Many times, microorganisms will be hidden under scales or paraffin, so it is, once again, important to _____ these formations.

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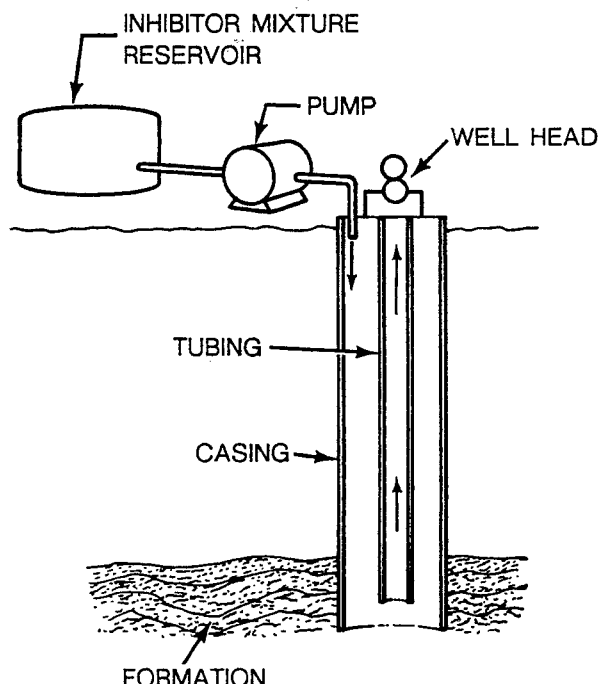
CHEMICAL APPLICATIONS

294. There are several common ways to apply inhibitors and neutralizers.

Batch method refers to a single application of chemical that occurs (continuously / periodically).

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295. Many times, this is done manually by pouring a given amount of chemical into the system.



In systems where a batch treatment cannot be evenly distributed, a continuous method is used.

Continuous application means applying a chemical, usually by a pump (in a single batch / at a steady, continuous rate).

296. Continuous application usually is not done manually. In this diagram, you see that it is applied by a (pump / packer).
297. With this method, the concentration of chemical will be constant. Therefore, protection is _____ .
298. So, in systems with a high production rate, where a large amount of fluid constantly passes through, it may be more effective to use a (batch / continuous) treatment.
299. Low volume oil and gas wells can get adequate protection with _____ application methods.
300. Another type of application, used mainly in high volume systems, is the squeeze method. The inhibitor is "squeezed" or forced into the formation below. The treatment chemical then makes its way back into the well with the produced fluid.

This increases the probability that only (treated / corrosive) fluids will come in contact with the down hole equipment.

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ANSWER MASK

301. Some caution must be taken when using these chemicals.
If two problems are being controlled with two different chemicals, they may react with each other and be (effective / ineffective).
302. Therefore, you should never _____ chemicals unless instructed to do so..
303. If there is a coating on the pipes, you must make sure the chemical that you use will not _____ the coating.
304. Once again, if you notice any changes in the fluid or on the structure, it is important to _____ it.
305. Caution must be used when applying chemicals as a method of treatment.
Adding an incorrect chemical or the wrong amount may cause more damage by (increasing / decreasing) the corrosion rate.
306. Chemicals can also be a health hazard.
Precautions must be taken when using chemicals with _____ fumes.
307. Chemical containers will also have warnings and handling instructions printed on them.
Always read and _____ these instructions.
308. It is also important to record when you applied the chemical and how much you applied.
If, for example, a storm prevented you from applying a chemical treatment, but you did apply it the next day. Make sure you record this, as it is important for future evaluations of the treating program.
It is necessary to accurately record how much inhibitor was applied and _____ you applied it.
309. It is important to report actions taken to control a problem as well as report the problem when no action is taken.
This way, proper steps can be taken to _____ the problem or evaluate at a later time.
310. Keeping an accurate inventory is also important. You, as the operator using the chemicals, will notice if the inventory is getting low.
Therefore, do not wait for the supply to run out — make sure the inventory gets _____ on time.
311. If you let the chemicals run out, proper treatment cannot continue and _____ will get worse.
312. If you happen to run out of the right chemical, *NEVER* use another chemical in its place because it may actually _____ the corrosion rate.

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