

OS-1L

OS-1L* oxygen scavenger is an ammonium bisulfite solution used to remove entrained oxygen from drilling and completion fluids.

The product is injected at the pump suction on a continuous basis to minimize atmospheric contact. OS-1L oxygen scavenger functions as a corrosion inhibitor by removing oxygen from the drilling or completion fluid while circulating.

Typical Physical Properties

Physical appearance	Yellow liquid
Specific gravity	1.3

Applications

Traces of oxygen dissolved in the water can cause corrosion problems in the drillstring.

OS-1L oxygen scavenger is injected continuously at the pump suction by a specialized, metered pump that permits injection into the downhole fluid with minimal atmospheric contact. This is important because the ammonium bisulfite would be rapidly spent by atmospheric contact.

The sulfite ion is monitored at the flowline using an excess sulfite test to determine if sufficient scavenger remains available. When the fluid returns to the surface, it once again comes in contact with the atmosphere and begins to pick up oxygen causing the effective concentration of OS-1L scavenger to drop. Samples should be collected as close to the bell nipple as practical.

CONCOR* 404 corrosion inhibitor is often used with OS-1L oxygen scavenger in drilling fluids to assist in complete corrosion control. OS-1L scavenger is also used with CONCOR 303-A or SAFE-COR* corrosion inhibitors in completion fluids.

Initially, the oxygen scavenger is injected at a rate of between 1 and 2.5 gal (3.8 and 9.5 L) per hour at the pump suction. Sulfite determinations are made with fluid collected at the flowline, and the injection rate is adjusted upwards or downwards depending on the detected sulfide test results.

The desired excess sulfite content is 100–300 mg/L at the flowline. This level assures that there is sufficient sulfite in the drilling fluid to remove oxygen to the desired low level.

Often, corrosion rings are used to monitor corrosion rates over several days of drilling to evaluate the overall corrosion program.

Advantages

Continuous injection of OS-1L oxygen scavenger is an important step in a comprehensive corrosion program. Significant factors affecting corrosion are as follows:

- Temperature—most corrosion rates increase with increasing temperature
- Fluid velocity—corrosion is accelerated by the erosive effect of moving fluid
- pH—in the presence of oxygen, corrosion rates increase rapidly as pH decreases from neutral, and generally decrease as the pH increases from neutral
- High stress—highly stressed areas usually corrode faster than areas of lower stress, eg., tubular pins and boxes
- Dissolved salts—salts will initially increase rates of corrosion, but as saturation is approached, corrosion rates decrease

Limitations

- OS-1L oxygen scavenger is sensitive to calcium content in the fluid. Hardness must be kept below 2,000 mg/L.
- CAUTION: OS-1L oxygen scavenger should not be added to containers with caustic soda. This will release ammonia gas and can cause an explosion.
- If the pH is above 10, ammonia gas may be released from the drilling fluid. Avoid very high pH levels.
- OS-1L oxygen scavenger is incompatible with glutaraldehyde-base biocides. Biocide may be applied before use, but biocidal activity is lost upon addition of OS-1L oxygen scavenger.

Toxicity and Handling

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheet (MSDS).

Packaging and Storage

OS-1L oxygen scavenger is packaged in 5-gal (18.9-L) cans and 55-gal (208-L) drums.

Store in a dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.



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