Hydrogen sulfide occurs naturally in crude oil and its presence in hydrocarbon fluids is a well-known problem in many oilfields. Besides posing severe HSE risks, H₂S can cause corrosion damage to pipework and equipment, either by reacting directly with the metal, or by increasing the acidity of the liquid/gas mixture. When dissolved in water H₂S may be oxidized to form elemental sulfur. This can also cause corrosion of metal surfaces. H₂S precursors (sulfur containing hydrocarbons) are also present in certain process streams: these precursors may form by thermally induced decomposition and liberate gaseous H₂S which will need to be treated. It is therefore essential to remove H₂S from those process streams as quickly and efficiently as possible.

Being the first producer of triazine in the world on an industrial scale has provided Vink with a deep understanding of state-of-the-art technology. Responding to the market needs for an upgraded solution, Vink has developed stabicor® S 100 as a non-triazine H₂S scavenger.

stabicor® S 100 ensures:

- Safer operations with reduced environmental impact and meeting regulatory requirements
- Optimum performance in upstream, midstream and downstream applications
- Very low dosing rates and thus cost-effective treatment
- High thermal stability and no polymer formation
- Excellent handling properties in cold regions
- Both oil and water solubility
Industry requires processes designed to successfully eliminate hydrogen sulphide or at least reduce it to an acceptable level for production, storage and further processing. The most common method used is treatment with hydrogen sulphide scavengers. There are different types of scavengers available that are mainly differentiated by their chemistry, mode of action and treatment cost and conditions.

These specialized chemicals react selectively with H₂S and remove it to help meet product and process specifications.

Products treated to remove H₂S include crude oil, fuels and other refined petroleum products in storage tanks, ships, railcars, and pipelines as well as process water streams.

Crude oil and its heavy residuals can contain very high concentrations of H₂S due to its natural composition or due to thermal cracking. These fluids must be treated with H₂S scavengers prior to refinery processes and their selection should not ignore further processing conditions.

For example, amine-based H₂S scavengers can contribute to salt fouling in distillation towers during refinery processing. In addition to that, transportation of H₂S contaminated crude oil requires additional precautions since some methods can increase exposure to personnel. To perform loading operations safely with a minimum impact to humans and the environment, the selection of the H₂S scavenger requires reference to contact time and mixing efficiency, in addition to also avoiding product quality changes prior to any refining processes.

**CASE STUDY | 11_2020**

Application fields for H₂S scavenging are among other pipelines, ships and storage tanks.
SCENARIO

- **Batch treatment of 1380 bopd**
  - Water cut: 0%
  - API gravity: 36
  - H₂S amount without chemical injection: 43ppm
  - Country: Middle East

Batch treatment of H₂S for transportation purposes with very limited contact time.

An oil production company requested the proposed product for batch H₂S treatment of export crude oil. Batch treatment was applied by circulating the produced crude oil within production tanks and loading tanks. Overall retention time was approximately 1 hour for mixing and 1-2 hours additional contact time prior to loading. The efficiency of the product within the given contact time was the key goal of the successful selection.

stabicor® S 100 showed excellent H₂S scavenging performance, effective in the ratio 5:1.

Additional benefits

- Fully oil soluble
- No contribution to haze formation
- Additional anticorrosion protection layer
- Less nitrogen introduction than industry standard

The H₂S content by gas sparging showed effective treatment, resulting in 3-5ppm H₂S within 2 hours contact time after stabicor® S 100 was dosed with limited mixing.

CHALLENGE

- Limited contact time
- Limited mixing
- Low-cost treatment requirements

SOLUTION

- MBO is 99% active component that is designed as a cost-effective treatment product

RESULT

- Reduction of H₂S to desired KPI with only 1h contact time (+1h mixing) for 1380b/d system
- Reduction of H₂S scavenger consumption