Hydrogen Sulphide Explosion

EPSC Learning Sheet , July 2019

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What Happened:

The vacuum breaker on a tank for molten sulphur was plugged blocking the air sweep gas flow, resulting in elevated H_2S concentration. An ignition source created an explosion.

H_2S dissolves from the molten Sulphur

Aspects:

- Vacuum breakers can foul on the inside when products condens or solidify at a lower temperature on the top of the tank
- Ventilation systems in sulphur tanks are safety critical and their function must be validated e.g. by a low flow alarm
- H_2S Lower Explosion Limit drops to about 3.3% at the elevated temperature applied to keep the Sulphur molten
- In this case the ignition source might be from a spark related to flowing molten sulphur, that is an accumulator for electrostatic charges (here during a truck loading)
- Grounding and bonding of sulphur tanks is critical, as well as follow-up of the EX zone inside the tank

Sulphur tanks need specific attention to avoid an H_2S explosion