SiGa-Tech
Sludge & biogas systems

H_2S removal plant

Bicarbox

Structure:
SRP - sulfur removal plant is made as a vertical filters with pelletized material, biogas condtioning and oxygen continuous bed regeneration. Reactosr are produced as a stainless steel structure.

Process:
Biogas containing H_2S is fed into filters. Desulfurizing material produced as mixture of activated carbons and additives which mainly increasing H_2S sorption capacity. H_2S is fixed on the active surface of bed. Thanks to air regeneration, hydrogen sulfide is oxidized to the elementar sulfur by surface catalytic oxidation.
During desulfurization using this method siloxanes and mercaptanes are also removed with high efficiency.

The following chemical reaction equation describe this process:

$$H_2S + 0.5\ O_2 \rightarrow S + H_2O$$

as well as catalytic equations:

$$2\ KJ + 0.5\ O_2 \rightarrow K_2O + J$$

$$H_2S + J_2 \rightarrow S + 2HJ$$

$$K_2O + 2HJ \rightarrow 2KJ + H_2O$$

This method required relative humidity < 50%, that why very often Bicarbox S is blocked with Draxel - biogas drying system produced by SiGa-Tech.

Reactions with mercaptane group:

$$2\ KJ + 0.5\ O_2 \rightarrow K_2O + J$$

$$2\ CH_3\text{-}CH_2\text{-}SH + J_2 \rightarrow CH_3CH_2\text{-}S\text{-}S\text{-}CH_2\text{-}CH_3 + 3HJ$$

$$2\ HJ + K_2J \rightarrow 2KJ + H_2O$$

$$2\ CH_3\text{-}CH_2\text{-}SH + 0.5\ O_2 \rightarrow CH_3CH_2\text{-}S\text{-}S\text{-}CH_2\text{-}CH_3 + H_2O$$

- **dry process on fixed bed filters;**
- **chemisorbtion and surface adsorbtion;**
- **continuous regeneration with oxygen;**
- **potassium iodide impregnated material;**
- **non-hazardous materials and wastes;**
- **H_2S concentration < 600ppm;**
- **biogas flow up to 2000m^3/h;**
- **min. bed life time 180d.**

Biocarbox S filters blocked with Draxel (biogas SiGa-Tech drying system).

Basic equipment:
Filters:
- insulated reactor with process pipelines, access manholes, Ex motor and manually operated butterfly valves, air distribution system.

Container:
- air supply system, temp. and O_2 conc. measurement, local PLC unit, electrical switch box, Ex. heater.

Options:
- inlet/ outlet pressure monitoring system;
- inlet/ outlet H_2S measurement system;
- frost protection.

More options are available on request

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