

FerroSorp[®] DG

Powdery desulphurication substance
for biogas plants

General remarks

Production and use of biogas became more important since the implementation of the "Renewable Energy Sources Act". Biogas is formed by anaerobic conversion of biomass. Beside the main components methane and carbon dioxide biogas often contains hydrogen sulphide which has to be removed before use to prevent odour and corrosion problems. Different desulphurication technologies were applied, as dosage of aerial oxygen, ferric salt addition, downstream removal with packed bed absorbents based on ferric hydroxide, or flue gas scrubbers and biological hydrogen sulphide oxidation respectively.

The problem

The dosage of aerial oxygen often has minor effectiveness on hydrogen sulphide formation and dilutes the biogas to lower calorific value. On the other hand downstream desulphurication methods demand high capital expenditure. Furthermore the formation of hydrogen sulphide in the digester is admitted though the inhibiting effect on methane synthesis is well known. Ferric salt addition results in a precipitation of sulphide in the digester. The disadvantages of this method are lowering of the fermenting substrates buffer capacity and restrictions in storage and handling due to the water hazard class respectively.



The solution

The problems mentioned above can be solved by a special desulphurication substance based on ferric hydroxide designed by HeGo Biotec GmbH. Hydrogen sulphide is precipitated inside the digester according to the following equations:



Procedure

The ferric hydroxide contained in FerroSorp® DG binds the hydrogen sulphide already during its formation. In a first step trivalent iron is reduced under anaerobic conditions to its divalent form. Thereby hydrogen sulphide can be oxidized to elemental sulphur already. In the second step divalent iron reacts with hydrogen sulphide forming dispersed iron sulphide noticeable as a blackening of the fermenting residue. Using FerroSorp® DG no supplemental anions were added to the substrate. Calcium compounds contained in FerroSorp® DG are enhancing the substrates buffer capacity and counteract acidification. Coprecipitation of trace elements is definitely prevented. Thus methanogenesis can proceed uninhibited resulting in optimal biogas yield with high methane contents.

Application

FerroSorp® DG can be added to biogas plants easily combined with the substrate. FerroSorp® DG is classified as "not hazardous to waters". Due to its chemical properties FerroSorp® DG can be recognized as safe. There are no special regulations concerning storage and handling for FerroSorp® DG.



General benefits

High active reagent for hydrogen sulphide precipitation in biogas plants.

Optimised biogas yield with high methane percentage.

Effective protection against acidification of the fermenting substrate by buffer capacity enhancement.

Cost effective compared to downstream hydrogen sulphide removal techniques due to higher biogas yield.

Easy to apply.

No increase in salinity.

Material recycling and waste management are not affected.



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