A problem arises when the content of amines is high in the feed steam to the reforming section as this leads to carbon formation in the reforming section either in the preheat equipment or on the catalyst bed.

The invention solves this problem by purging the required part of the process condensate prior to the MP stripper thus reducing the amine level at inlet of the reforming section to an acceptable level.

The purge can be handled in a separate unit, for example a low pressure stripper from where the dissolved gases, ammonia and amines can be released as off-gas and can be used as fuel.

The low pressure is defined as a pressure which is lower than the pressure inlet the reforming section, for example 0.5 bar g to 20. bar g or 1.5 bar g to 10 bar g or preferably 2.0 bar g to 7. bar g

In a further embodiment all stripper steam can be admitted downstream the reforming section upstream the last shift reactor. The built-up of ammonia and amines in the shift section will in this case be control by the rate of process condensate purge flow.

Summary

In one aspect of the present disclosure, there is provided a process for producing synthesis gas, the process comprising the steps of

a) reforming a hydrocarbon feed in a reforming section thereby obtaining a synthesis gas comprising CH_4, CO, CO_2, H_2 and H_2O and impurities comprising ammonia;

b) shifting the synthesis gas in a shift section comprising one or more shift steps in series to a shifted synthesis gas;

c) separating from the shifted synthesis gas a process condensate originating from cooling and optionally washing of the shifted synthesis gas;

d) passing a part of the process condensate to a condensate steam stripper, wherein dissolved shift byproducts comprising ammonia, methanol and amines formed during

shifting the synthesis gas are stripped out of the process condensate using steam resulting in a stripper steam stream,

e) adding the stripper steam stream from the process condensate steam stripper to the hydrocarbon feed and/or to the synthesis gas downstream the reforming section, upstream the last shift step, wherein

the remaining part of the process condensate is purged.

Description

Thus, the invention is a process for producing synthesis gas, the a process for producing synthesis gas, the process comprising the steps of

a) reforming a hydrocarbon feed in a reforming section thereby obtaining a synthesis gas comprising CH_4, CO, CO_2, H_2 and H_2O and impurities comprising ammonia;

b) shifting the synthesis gas in a shift section comprising one or more shift steps in series to a shifted synthesis gas;

c) separating from the shifted synthesis gas a process condensate originating from cooling and optionally washing of the shifted synthesis gas;

d) passing a part of the process condensate to a condensate steam stripper, wherein dissolved shift byproducts comprising ammonia, methanol and amines formed during shifting the synthesis gas are stripped out of the process condensate using steam resulting in a stripper steam stream,