the highest possible methane content and the lowest possible content of higher hydrocarbons containing at least two carbon atoms (hereinafter referred to as C_{2+} hydrocarbons).

SUMMARY

In an aspect of the present disclosure, there is provided a method for purifying a flow (1) of natural gas, comprising the following steps:

a) a step (5) of processing at least a portion (3) of said flow (1) by pyrolysis at a temperature in the range of from 1000°C to 2000°C, so as to decompose hydrocarbons comprising at least two carbon atoms into elemental carbon and dihydrogen H_2 and thus obtain a processed flow (6), then

b) a step (7) of eliminating the elemental carbon present in the processed flow (6) from step a) so as to obtain a processed flow (8) free of elemental carbon; then

c) when steps a) and b) have been carried out on a portion of the flow (1) of natural gas only, a step (10) of mixing the processed flow (8) free of elemental carbon from step b) with the portion (4) of the non-processed flow; then

d) obtaining a flow of purified natural gas (11) consisting either of the mixture (10) from step c) or of the processed flow (8) free of elemental carbon from step b).

In another aspect of the present disclosure, there is provided a method for preparing a fuel for an internal combustion engine, comprising:

(i) purifying a flow of natural gas using the method as defined in any of the preceding claims; and then

(ii) conditioning the flow of natural gas from step (i) as compressed natural gas, adsorbed natural gas or liquefied natural gas, preferably as compressed natural gas.

OBJECT OF THE INVENTION

The purpose of the present invention is to provide an original method for purifying natural gas, which makes it possible to achieve the above objectives of reducing its C_{2+} hydrocarbon content, while at the same time increasing its methane content.

Particularly advantageously, the method also makes it possible to enrich the natural gas with dihydrogen, without generating carbon dioxide.

Thus one object of the present invention is a method for purifying a flow of natural gas, which comprises the following steps:

a) a step of processing at least a portion of said flow by pyrolysis at a temperature in the range of from 1000°C to 2000°C, so as to decompose hydrocarbons comprising at least two carbon atoms into elemental carbon and dihydrogen H_2 and thus obtain a processed flow, then

b) a step of eliminating the elemental carbon present in the processed flow from step a) so as to obtain a processed flow free of elemental carbon; then

c) when steps a) and b) have been carried out on a portion of the flow of natural gas only, a step of mixing the processed flow free of elemental carbon from step b) with the portion of the non-processed flow; then

d) obtaining a flow of purified natural gas consisting either of the mixture from step c) or of the processed flow free of elemental carbon from step b).