SUMMARY

[0029] This technical problem is solved, completely or at least partially, by the present disclosure. Yet other advantages will become clear from the description of the disclosure given hereunder.

[0030] The present disclosure relates to the use, in a method for in-situ activation of at least one hydrotreating, in particular hydrocracking, catalyst, of at least one nitrogen compound having at least one, preferably at least two, more preferably at least three, even more preferably at least four of the following characteristics:

a) a nitrogen content by weight in the range from 15 to 35 wt%, preferably in the range from 20 to 35%, more preferably in the range from 20 to 30%, and more advantageously in the range from 20 to 25% relative to the total weight of the nitrogen compound;
b) a number of nitrogen atoms in the range from 2 to 20, preferably in the range from 2 to 15, more preferably in the range from 2 to 10, even more preferably in the range from 2 to 5, per molecule, advantageously two nitrogen atoms per molecule;
c) a boiling point in the range from 140°C to 300°C, preferably in the range from 140°C to 250°C, more preferably in the range from 140°C to 200°C, even more preferably in the range from 140°C to 175°C; and
d) said nitrogen compound being in liquid form at room temperature and atmospheric pressure.

[0030a] In an aspect, there is provided the use, in a method for in-situ activation of a hydrotreating catalyst, of at least one nitrogen compound having the following characteristic b) and at least one, preferably at least two, and more preferably at least three of the following characteristics a), c) or d):

a) a nitrogen content by weight in the range from 15 to 35 wt%, preferably in the range from 20 to 35%, more preferably in the range from 20 to 30%, and more preferably in the range from 20 to 25% relative to the total weight of the nitrogen compound;
b) a number of nitrogen atoms in the range from 2 to 20, preferably in the range from 2 to 15, more preferably in the range from 2 to 10, even more preferably in the range from 2 to 5, per molecule, preferably two nitrogen atoms per molecule;
c) a boiling point in the range from 140°C to 300°C, preferably in the range from 140°C to 250°C, more preferably in the range from 140°C to 200°C, even more preferably in the range from 140°C to 175°C; and
d) said nitrogen compound being in liquid form at room temperature and atmospheric pressure.

[0031] The disclosure also relates to the use of at least one nitrogen compound as

CLAIMS

1. Use, in a method for in-situ activation of a hydrotreating catalyst, of at least one nitrogen compound having the following characteristic b) and at least one, preferably at least two, and more preferably at least three of the following characteristics a), c) or d):

a) a nitrogen content by weight in the range from 15 to 35 wt%, preferably in the range from 20 to 35%, more preferably in the range from 20 to 30%, and more preferably in the range from 20 to 25% relative to the total weight of the nitrogen compound;

b) a number of nitrogen atoms in the range from 2 to 20, preferably in the range from 2 to 15, more preferably in the range from 2 to 10, even more preferably in the range from 2 to 5, per molecule, preferably two nitrogen atoms per molecule;

c) a boiling point in the range from 140°C to 300°C, preferably in the range from 140°C to 250°C, more preferably in the range from 140°C to 200°C, even more preferably in the range from 140°C to 175°C; and

d) said nitrogen compound being in liquid form at room temperature and atmospheric pressure.

2. Use according to the preceding claim, in which the nitrogen compound has in addition a molecular weight in the range from 80 $g.mol^{-1}$ to 300 $g.mol^{-1}$, preferably in the range from 100 $g.mol^{-1}$ to 250 $g.mol^{-1}$, even more preferably in the range from 100 $g.mol^{-1}$ to 200 $g.mol^{-1}$, preferably in the range from 120 $g.mol^{-1}$ to 150 $g.mol^{-1}$; designated as characteristic e) hereinafter.

3. Use according to any one of the preceding claims, in which the nitrogen compound has a characteristic f) such that said nitrogen compound does not comprise an aromatic or cyclic group.

4. Use according to any one of the preceding claims, in which said at least one nitrogen compound necessarily has characteristic b).

5. Use according to any one of Claims 1 to 4, in which the nitrogen compound is selected from N,N'-diethyl-1,3-propanediamine (DEAPA), tetramethyl-1,3-propanediamine (TMPDA), N-methyl-1,3-propanediamine, N,N'-dibutyl-1,3-propanediamine, N-(3-dimethylaminopropyl)propane-1,3-diamine (DMAPAPA), N-(3-aminopropyl)-1,3-

propanediamine, N,N'-1,2-ethanediyl-bis-1,3-propanediamine, N-(aminopropyl)diethanolamine (APDEA), and mixtures thereof.

6. Use of the nitrogen compound or compounds as defined in any one of the preceding claims for controlling the activity of at least one hydrotreating catalyst.

7. Use of the nitrogen compound or compounds as defined in any one of Claims 1 to 4 for passivating the acid sites of the hydrotreating catalyst.

8. Method for in-situ activation of at least one hydrotreating catalyst comprising at least:

1) a step of sulphiding said hydrotreating catalyst in the presence of a sulphiding agent; and

2) a step of passivation of said hydrotreating catalyst in the presence of at least one nitrogen compound as defined in any one of Claims 1 to 4.

9. Method according to Claim 8, in which the sulphiding step and the passivation step are carried out simultaneously.

10. Method according to Claim 8 or Claim 9, in which the nitrogen compound is injected in liquid phase or in gas phase, preferably in liquid phase.

11. Method according to any one of Claims 8 to 10, in which the nitrogen compound is injected at a content in the range from 0.01 to 20 wt%, preferably from 0.01 to 10 wt%, more preferably from 0.01 to 5 wt%, relative to the total weight of the hydrotreating catalyst.

12. Method according to any one of Claims 8 to 11, in which in the sulphiding step, the sulphiding agent is selected from hydrogen sulphide, carbon disulphide, dimethyl disulphide (DMDS), dimethyl sulphide, mercaptans, thiophenes and derivatives, alkyl polysulphides, dialkyl polysulphides and all sulphide compounds capable of sulphiding the metal oxides of the hydrotreating catalysts, and preferably the sulphiding agent is DMDS.

13. Method for in-situ activation according to any one of Claims 8 to 12 of at least one hydrocracking catalyst comprising at least:

1) a step of sulphiding said hydrocracking catalyst in the presence of a sulphiding agent; and

2) a step of passivation of said hydrocracking catalyst in the presence of at least one nitrogen compound as defined in any one of Claims 1 to 5.