CLAIMS

1. A process for the hydrodesulfurization of a gasoline cut containing sulfur-comprising compounds and olefins, in which said gasoline cut, hydrogen and a catalyst are brought into contact, said process being carried out at a temperature of between 200° C and 400° C, a total pressure of between 1 and 3 MPa, an hourly space velocity, defined as being the flow rate by volume of feedstock relative to the volume of catalyst, of between 1 and 10 h^{-1} and a hydrogen/gasoline feedstock ratio by volume of between 100 and 1200 Sl/l, said catalyst comprising an oxide support, sulfur and an active phase comprising at least one metal from group VIb and at least one metal from group VIII, said catalyst additionally containing a graphitic material containing carbon and hydrogen, the carbon content, expressed as carbon element, being between 5% and 20% by weight, with respect to the weight of the catalyst, and the H/C atomic ratio being between 0.8 and 1.2, said graphitic material not containing oxygen.

2. The process as claimed in the preceding claim, in which the carbon content, expressed as carbon element, is between 10% and 15% by weight, with respect to the weight of the catalyst.

3. The process as claimed in either of the preceding claims, in which the sulfur content, expressed as sulfur element, is between 1% and 8% by weight, with respect to the weight of the catalyst.

4. The process as claimed in one of the preceding claims, in which the catalyst has a content of metal from group VIb of between 5% and 40% by weight, expressed as oxide of metal from group VIb, with respect to the total weight of the catalyst, and a content of metal from group VIII of between 1% and 10% by weight, expressed as oxide of metal from group VIII, with respect to the total weight of the catalyst.

5. The process as claimed in one of the preceding claims, in which the metal from group VIII to metal from group VIb molar ratio in the catalyst is between 0.1 and 0.8.

6. The process as claimed in one of the preceding claims, in which the specific surface of the catalyst is between 20 and 200 m^2/g.

7. The process as claimed in one of the preceding claims, in which the catalyst additionally comprises phosphorus at a content of between 0.1% and 20% by weight, expressed as P_2O_5, with respect to the total weight of the catalyst.

8. The process as claimed in one of the preceding claims, in which the catalyst additionally comprises an organic compound containing oxygen and/or nitrogen and/or sulfur.

9. The process as claimed in the preceding claim, in which the organic compound is chosen from a compound comprising one or more chemical functional groups chosen from a carboxyl, alcohol, thiol, thioether, sulfone, sulfoxide, ether, aldehyde, ketone, ester, carbonate, amine, nitrile, imide, oxime, urea or amide functional group or a compound including a furan ring or also a sugar.

10. The process as claimed in claim 9, in which the organic compound is chosen from γ-valerolactone, 2-acetylbutyrolactone, triethylene glycol, diethylene glycol, ethylene glycol, ethylenediaminetetraacetic acid (EDTA), maleic acid, malonic acid, citric acid, acetic acid, oxalic acid, gluconic acid, glucose, fructose, sucrose, sorbitol, xylitol, γ-ketovaleric acid, a di(C_1-C_4 alkyl) succinate and more particularly dimethyl succinate, dimethylformamide, 1-methyl-2-pyrrolidinone, propylene carbonate, 2-methoxyethyl 3-oxobutanoate, bicine, tricine, 2-furaldehyde (also known under the name furfural), 5-hydroxymethylfurfural, 2-acetylfuran, 5-methyl-2-furaldehyde, ascorbic acid, butyl lactate, ethyl lactate, butyl butyryllactate, ethyl 3-hydroxybutanoate, ethyl 3-ethoxypropanoate, 2-ethoxyethyl acetate, 2-butoxyethyl acetate, 2-hydroxyethyl acrylate, 1-vinyl-2-pyrrolidinone, 1,3-dimethyl-2-imidazolidinone, 1,5-pentanediol, 1-(2-hydroxyethyl)-2-pyrrolidinone, 1-(2-hydroxyethyl)-2,5-pyrrolidinedione, 5-methyl-2(3H)-furanone, 1-methyl-2-piperidinone, 4-aminobutanoic acid, butyl glycolate, ethyl 2-mercaptopropanoate, ethyl 4-oxopentanoate, diethyl maleate, dimethyl maleate, dimethyl fumarate, diethyl fumarate, dimethyl adipate and dimethyl 3-oxoglutarate.

11. The process as claimed in one of the preceding claims, in which the active phase of the catalyst is constituted by cobalt and molybdenum.

12. The process as claimed in one of the preceding claims, in which the catalyst is prepared according to a preparation process comprising the following stages:

a) at least one hydrocarbon and one sulfur-comprising compound are brought into contact with said oxide support, making it possible to form said graphitic material comprising carbon and hydrogen on the oxide support,

b) then a compound comprising a metal from group VIb and a compound comprising a metal from group VIII, and optionally phosphorus and/or at least one organic compound comprising oxygen and/or nitrogen and/or sulfur, are brought into contact with said oxide support containing said graphitic material,

so as to obtain a catalytic precursor,

c) said catalytic precursor is dried at a temperature of less than 200° C, without subsequent calcination, so as to obtain a dried catalyst.

d) the dried catalyst is optionally activated in the presence of a sulfiding agent.

13. The process as claimed in one of claims 1 to 11, in which the catalyst is an at least partially spent catalyst resulting from a hydrotreating process.

14. The process as claimed in one of the preceding claims, in which the gasoline is a catalytic cracking gasoline.