CLAIMS

1. A method for hydrotreating hydrocarbon feedstocks, said method comprising contacting a hydrocarbon feedstock under hydroprocessing hydrotreating conditions with a bulk catalyst composition comprising bulk metal particles, wherein said bulk metal particles are made by a process comprising:

(i) combining and reacting, in a reaction mixture comprising a protic liquid, at least one compound containing a Group VIII non-noble metal and at least one compound containing a Group VIB metal, the at least one Group VIII non-noble metal comprising Ni, in the presence of

(ii) added dispersable nanoparticles consisting essentially of laponite having a dimension of less than 1 μm and a smallest dimension of less than 5 nm when dispersed in the protic liquid to form bulk metal particles;

(iii) calcining the bulk metal particles to convert said compound containing a Group VIII non-noble metal and said compound containing a Group VIB metal to their metal oxide forms; wherein:

the combined weight of Group VIII non-noble metal and Group VIB metal (i) in said bulk metal particles, calculated as weight of metal oxides relative to the total weight of bulk metal particles, represents from 50 wt.% to 99.5 wt.% of the total weight of the bulk metal particles;

the weight of nanoparticles (ii) in said bulk metal particles represents from 0.5 wt.% to 10 wt. % relative to the total weight of metal oxides and nanoparticles; and

the hydrodesulfurization activity of the bulk catalyst composition containing laponite is greater than a catalyst composition with the same metal content that does not contain laponite.

2. The method of claim 1, wherein the combined weight of Group VIII non-noble metal and Group VIB metal in said bulk metal particles, calculated as weight of metal oxides, represents from 70 wt.% to 99 wt.% relative to the total weight of the bulk metal particles.

3. The method of claim 1, wherein the weight of nanoparticles in said bulk metal particles represents from 0.75 to 10 wt.%, relative to the total weight of metal oxides and nanoparticles.

4. The method of claim 1, wherein the weight of nanoparticles in said bulk metal particles represents from 1 to 5 wt.%, relative to the total weight of metal oxides and nanoparticles.

5. The method according to claim 1, wherein the nanoparticles are platelets having a thickness of 0.1 to 1.5 nm, an aspect ratio of 100 to 1500 and a surface area greater than 250 m^2/g.

6. The method according to claim 1, wherein the at least one Group VIB metal is molybdenum and/or tungsten.

7. The method according to claim 1, wherein the metals present in the bulk metal particles consist essentially of nickel, tungsten and molybdenum.

8. The method according to claim 1, wherein the metals present in the bulk metal particles consist essentially of nickel and tungsten.

9. The method according to claim 1, wherein the bulk metal particles further comprise a Group V metal.

10. The method according to claim 1, wherein said hydrotreating conditions include temperatures ranging from about 100°C to about 450°C, liquid hourly space velocities ("LHSV") from about 0.05 to about 20 hr^{-1}, pressures from about 5 to about 250 bar, and a hydrogen (H_2) to oil ratio from about 18 to about 1800 m^3/m^3 (100 to 10000 SCF/B).

11. The method according to claim 1, wherein the hydrocarbon feedstock has a boiling range of from about 150 °C to about 650°C.

12. The method according to claim 1, wherein at least one of the Group VIB and Group VIII metal compounds is partly in the solid state during the process of manufacturing the bulk metal particles.

13. The method according to claim 12, wherein the Group VIB and Group VIII metal compounds are partly soluble in the protic liquid.

14. The method according to claim 12, in which the reaction mixture is prepared by:

a) preparing a first suspension of the at least one compound containing a Group VIII non-noble metal in a protic liquid;

b) preparing a second suspension of the at least one compound containing a Group VIB metal in a protic liquid; and

c) combining the first and second suspensions,

wherein either the first, second, or both the first and second suspensions contain the nanoparticles.

15. The method according to claim 14, wherein said at least one compound containing a Group VIII non-noble metal comprises nickel carbonate or nickel hydroxycarbonate precipitated in the presence of laponite nanoparticles having a dimension of less than 1 pm.

16. The method according to claim 1, wherein the bulk metal particles obtained after reaction are subjected to one or more of the following steps:

(a) compositing the bulk metal particles with a material selected from the group consisting of binder materials, conventional hydroprocessing catalysts, cracking compounds or mixtures thereof;

(b) spray-drying, (flash) drying, milling, kneading, slurry-mixing, dry or wet mixing or combinations thereof;

(c) shaping;

(d) drying and/or thermally treating;

(e) or sulfiding.

17. The method according to claim 16 in which the bulk metal particles are composited with a binder material, shaped and dried and sulfided.