THAT WHICH IS CLAIMED IS:

1. A supported catalyst comprising a carrier, at least one Group VI metal, at least one Group VIII metal, and a polymer, where the molar ratio of the Group VI metal to the Group VIII metal is about 1:1 to about 5:1, and where the polymer has a carbon backbone and comprises functional groups having at least one heteroatom.

2. A supported catalyst as in Claim 1 wherein said carrier is carbon, carbon in combination with one or more inorganic oxides, boria, titania, silica, alumina, silica-alumina, alumina with silica-alumina dispersed therein, alumina-coated silica, silica-coated alumina, alumina containing boron, alumina containing silicon, alumina containing titanium, or a combination of any two or more of these.

3. A supported catalyst as in Claim 1 wherein the functional groups of the polymer are carboxylic acid groups or amido groups.

4. A supported catalyst as in Claim 1 wherein the polymer is polymaleic acid, polyfumaric acid, polyacrylic acid, poly(2-carboxyethyl)acrylate, poly(N-hydroxyethyl)acrylamide, polyacrylamide, or a co-polymer of any two or more of the foregoing.

5. A supported catalyst as in Claim 1 wherein the polymer is polyacrylic acid or polyacrylamide.

6. A supported catalyst as in any of Claims 1-5 wherein said Group VI metal is molybdenum and/or tungsten, and/or wherein said Group VIII metal is nickel and/or cobalt.

7. A supported catalyst as in any of Claims 1-5 which has a polymer loading of about 1.5 wt% or more, relative to the total weight of the carrier, Group VI metal, and Group VIII metal, where the Group VI metal and Group VIII metal are expressed as their oxides.

8. A supported catalyst as in any of Claims 1-5 which has an average particle size of about 0.5 mm to about 5 mm.

9. A supported catalyst as in any of Claims 1-5 wherein the carrier is about 40 wt% to about 80 wt% relative to the total weight of the carrier, Group VI metal, and Group

10. A supported catalyst as in Claim 2 wherein the carrier is carbon, or alumina containing boron, alumina containing silicon, and/or alumina containing titanium.

11. A method for hydrotreating, hydrodenitrogenation, and/or hydrodesulfurization, which method comprises contacting a hydrocarbon feed and a supported catalyst of any of Claims 1-10.

12. A process for forming a supported catalyst, which process comprises

I) bringing together a carrier, one or more monomer species, a solvent, and a peroxomolybdocobaltate compound or at least one Group VI metal compound and at least one Group VIII metal compound, in any of the following combinations:
   a) a carrier, one or more monomer species, and a solvent,
   b) a carrier, one or more monomer species, and a peroxomolybdocobaltate compound or at least one Group VI metal compound and at least one Group VIII metal compound, or
   c) a carrier and an impregnation solution, forming an impregnated carrier, followed by mixing the impregnated carrier with one or more monomer species,

   to form a monomer-containing mixture, where said one or more monomer species is soluble in the solvent and has carbon-carbon unsaturation and at least one functional group comprising at least one heteroatom; and

II) initiating polymerization of at least a portion of said one or more monomer species in the monomer-containing mixture to form a polymerized product;

III) when the monomer-containing mixture in I) is formed as in a), either
   A) contacting an impregnation solution and the monomer-containing mixture during the polymerization in II), or
   B) contacting the polymerized product and an impregnation solution;

to form a supported catalyst, where the molar ratio of the Group VI metal to the Group VIII metal is about 1:1 to about 5:1, and where said impregnation solution comprises a solvent, at least one Group VI metal, and at least one Group VIII metal.

13. A process as in Claim 12 wherein a single impregnation step is carried out

a) in I) when bringing together a carrier, one or more monomer species, and a peroxomolybdocobaltate compound or at least one Group VI metal compound and at least one Group VIII metal compound;

c) in III).

14. A process as in Claim 12 further comprising removing excess solvent from the supported catalyst.

15. A process as in Claim 14 wherein the polymerizing is carried out during the removing of excess solvent.

16. A process as in Claim 12 further comprising sulfiding the supported catalyst.

17. A process as in Claim 12 wherein the monomer-containing mixture in I) is formed as in b).

18. A process as in Claim 12 wherein the heteroatom of the functional group of the monomer species comprises nitrogen, oxygen, phosphorus, and/or sulfur.

19. A process as in Claim 12 wherein the functional group of the monomer species is a carboxylic acid group, an ester group, a carboxyl group, or an amido group.

20. A process as in Claim 12 wherein the monomer species is maleic acid, fumaric acid, acrylic acid, 2-carboxyethyl acrylate, acrylamide, or N-hydroxyethyl acrylamide.

21. A process as in Claim 12 wherein the monomer species is acrylic acid or acrylamide.

22. A process as in Claim 12 in which the monomer species is in an amount of about 1.5 wt% or more, relative to the total weight of the carrier, Group VI metal compound, and Group VIII metal compound, where the Group VI metal compound and Group VIII metal compound are expressed as oxides.

23. A process as in Claim 12 wherein said carrier is carbon, boria, titania, silica, alumina, silica-alumina, alumina with silica-alumina dispersed therein, alumina-coated silica, silica-coated alumina, alumina containing boria and/or alumina containing titania.

24. A process as in Claim 12 wherein a chemical substance is employed as an initiator, and wherein the chemical substance comprises a persulfate salt.

25. A process as in Claim 17 wherein said solvent is water.

26. A process as in Claim 17 wherein said Group VI metal compound is an oxide or an oxo-acid.

27. A process as in Claim 17 wherein said Group VIII metal compound is a carbonate, hydroxide, or hydroxy-carbonate.

28. A process as in any of Claims 25-27 wherein said Group VI metal compound is a molybdenum compound and/or a tungsten compound, and/or wherein said Group VIII compound is a nickel and/or cobalt compound.

29. A process as in any of Claims 12-21 wherein a peroxomolybdocobaltate compound is used, and wherein the carrier is alumina, alumina containing silica, alumina containing boria, alumina containing titania, or a mixture of any two or more of these.

30. A process as in any of Claims 12-29 wherein the carrier has been calcined and/or extruded prior to step I) of the process.

31. A process as in any of Claims 12-29 wherein the carrier has an average particle size of about 0.5 mm to about 5 mm, and wherein the supported catalyst has an average particle size of about 0.5 mm to about 5 mm.

32. A process as in Claim 28 wherein the carrier is alumina containing boron, alumina containing silicon, alumina containing titanium, or a combination of any two or more of these.

33. A process as in any of Claims 12-31 wherein when the monomer-containing mixture in I) is formed as in b) or c), and the carrier is alumina, alumina containing silica, alumina containing boria, alumina containing titania, or a mixture of any two or more of these, the polymerizing is initiated by heating the monomer-containing mixture to one or more temperatures of about 50°C or above.

34. A supported catalyst formed as in any of Claims 12-30.

35. A supported catalyst as in Claim 34 wherein said Group VI metal is molybdenum and/or tungsten, and/or wherein said Group VIII compound is nickel and/or cobalt.

36. A supported catalyst as in any of Claims 34-35 which has an average particle size of about 0.5 mm to about 5 mm.

37. A supported catalyst as in any of Claims 34-35 wherein the carrier is about 40 wt% to about 80 wt% relative to the total weight of the carrier, Group VI metal, and Group VIII metal, where the Group VI metal and Group VIII metal are expressed as their oxides.

38. A method for hydrotreating, hydrodenitrogenation, and/or hydrodesulfurization, which method comprises contacting a hydrocarbon feed and a supported catalyst of Claim 33.