C L A I M S

1. A hydroprocessing catalyst composition, wherein said hydroprocessing catalyst composition, comprisingcomprises: a support material that is either loaded with an active metal precursor or contains a metal components including a cobalt or nickel component, a molybdenum component, and a phosphorous component, and having been dried but not calcined, wherein at least 75% of its pore volume is filled with an additive consisting essentially of a metal salt solution and a heterocyclic additive and a heterocyclic additive, wherein said heterocyclic additive is a heterocyclic, polar compound of the formula $C_xH_nN_yO_z$, wherein x is an integer of 3 or larger; y is either 0, 1, 2 or 3; z is either 0, 1, 2 or 3; and n is the number of hydrogen atoms required to fill the remaining bonds with the carbon atoms of the molecule, and further, said heterocyclic, polar compound is selected from the group consisting of cyclic ether compounds and cyclic ester compounds.

2. A catalyst composition as recited in claim 1, wherein said catalyst composition further comprises a material absence of a hydrocarbon oil.

3. A catalyst composition as recited in any one of claims 1 or 2, wherein said support material is further thereafter treated with a gas comprising hydrogen.

4. A catalyst composition as recited in any one of claims 1, 2 or 3, wherein said active metal precursor is a metal compound that includes a metal component selected from the group consisting of cobalt, nickel, molybdenum, chromium, tungsten and any combination of two or more thereof.

5. A catalyst composition as recited in claim 4, wherein said metal component is present in said catalyst composition in an amount in the range of from 5 wt. % to 50 wt. %.

6. A catalyst composition as recited in any one of claims 1, 2, 3, 4 or 5, wherein said heterocyclic additive is selected from the group of heterocyclic, polar compounds of the formula $C_xH_nN_yO_z$, wherein x is an integer of 3 or larger; y is either 0, 1, 2 or 3; z is either 0, 1, 2 or 3; and n is the number of hydrogen atoms required to fill the remaining bonds with the carbon atoms of the molecule.

7. A catalyst composition as recited in any one of claims 1, 2, 3, 4, 5 or 6, wherein said heterocyclic additive is a heterocyclic compound containing either nitrogen or oxygen as the heteroatom member of its ring providing either a lactam structure or a cyclic ester structure.

84. A catalyst composition as recited in any one of claims 1, 2, 3, 4, 5, 6 or 7, wherein the additive is either propylene carbonate or N-methylpyrrolidone, or a combination of both.

95. A catalyst composition as recited in claim 41, wherein said metal compound includes a Group 9 and Group 10 metal component selected from the group consisting of cobalt and nickel, and wherein said Group 9 and Group 10 metal cobalt or nickel component is present in said composition in an amount in the range of from 0.5 wt.% to 20 wt.%, and wherein said metal compound further includes a Group 6 metal component selected from the group consisting of molybdenum and tungsten, and wherein said Group 6 metal molybdenum component is present in said composition in an amount in the range of from 5 wt.% to 50 wt.%.

106. A method of making a hydroprocessing catalyst composition, wherein said method comprises:

incorporating a metal-containing solution, comprising a cobalt or nickel component, a molybdenum component, and a phosphorous component, into a support material to provide a metal-incorporated support material; and

drying said metal-incorporated support material to provide a dried metal-impregnated support material; and

incorporating filling at least 75% of the pore volume of said dried metal-impregnated support material with an additive consisting essentially of a heterocyclic compound additive selected from the group consisting of cyclic ether compounds and cyclic ester compounds of the formula $C_xH_nN_yO_z$, wherein x is an integer of 3 or larger; y is either 0, 1, 2 or 3; z is either 0, 1, 2 or 3; and n is the number of hydrogen atoms required to fill the remaining bonds with the carbon atoms of the molecule, into said metal-incorporated support material to thereby provide an additive-impregnated composition.

117. A method as recited in claim 106, further comprising: contacting said additive-impregnated composition under suitable hydrogen treatment conditions with hydrogen to thereby provide a hydrogen-treated composition.

128. A method as recited in claim 117, wherein prior to said incorporating of said heterocyclic compound additive into said metal-incorporated support material, said dried metal-incorporated support material is dried so as to containhas a volatiles content in the range of from 3 to 20 wt. % LOI.

9. A method as recited in claim 8, wherein said cobalt or nickel component is present in said composition in an amount in the range of from 0.5 wt. % to 20 wt. %, and wherein said molybdenum component is present in said composition in an amount in the range of from 5 wt. % to 50 wt. %.

10. A composition made by the method of claim 6.

1311. A process for hydrotreating a hydrocarbon feedstock, wherein said process comprises: contacting under suitable hydrotreating process conditions said hydrocarbon feedstock with the catalyst composition recited in claim 1; and yielding a treated product.