CLAIMS

1. A supported catalyst comprising at least one metal containing catalyst component and at least one phosphorous containing catalyst component, wherein the metal in the metal containing catalyst component is least one selected from Group VIB of the Periodic Table of the Elements, at least one other one metal selected from Group VIII of the Periodic Table of the Elements, and wherein said catalyst components are carried on a foraminous support, said catalyst being characterized as having:

(a) a Group VIII metal component to Phosphorous component molar ratio of less than 0.60:1;

(b) a Group VIII metal component to Group VIB metal component molar ratio of less than 0.45:1;

(c) a phosphorous component to Group VIB metal component molar ratio from about 0.65:1 to 0.90:1; and

(d) a median pore diameter of from about 80Å to about 90Å.

2. The catalyst of claim 1 wherein:

(a) the Group VIII metal component to Phosphorous component molar ratio is from about 0.05:1 to about 0.59:1;

(b) the Group VIII metal component to Group VIB metal component molar ratio is from about 0.05 to about 0.44:1;

(c) the phosphorous component to Group VIB metal component molar ratio is from about 0.65:1 to 0.90:1; and

(d) the support comprises alumina.

3. The catalyst of claim 2 wherein:

(a) the Group VIII metal is selected from cobalt, nickel and mixtures thereof; and

(b) the Group VIB metal is selected from chromium, tungsten and molybdenum and mixtures thereof.

4. The catalyst of claim 1, wherein the surface area of the catalyst is from about 150 to about 350 m^2/g, and the total pore volume of the support is from about 0.5 to about 1.1 cc/g.

5. The catalyst of claim 1 exhibiting a combination of hydrodenitrogenation (HDN) selectivity greater than 152% and relative metals tolerance of greater than 50%, wherein HDN selectivity is calculated as the ratio of the rate constant for hydrodenitrogenation to the rate constant for hydrodesulfurization (HDS), kHDN/kHDS, and metals tolerance is calculated as the time it takes for HDS activity to fall to 20% of its initial activity.

6. A method for preparing a catalyst having a high hydrodenitrogenation (HDN) selectivity during hydroprocessing of a feedstock, which method comprises impregnating a foraminous support with an aqueous solution containing at least one metal containing catalyst component and at least one phosphorous containing catalyst component, wherein the metal in the metal containing catalyst component is least one selected from Group VIB of the Periodic Table of the Elements, at least one other metal in the metal containing catalyst component is selected from Group VIII of the Periodic Table of the Elements, said components being thermally decomposable to the metal oxides, and thereafter drying and calcining the resulting impregnated support to provide a supported catalyst, said supported catalyst being characterized as having:

(a) a Group VIII metal component to Phosphorous component molar ratio of less than 0.60;

(b) a Group VIII metal component to Group VIB metal component molar ratio of less than 0.45;

(c) a phosphorous component to Group VIB metal component molar ratio of from about 0.65 to 0.90; and

(d) a median pore diameter from about 80Å to about 90Å.

7. The method of claim 6 wherein:

(a) the Group VIII metal component to Phosphorous component molar ratio is from about 0.05:1 to about 0.59:1;

(b) the Group VIII metal component to Group VIB metal component molar ratio is from about 0.05 to about 0.44:1;

(c) the phosphorous component to Group VIB metal component molar ratio is from about 0.65:1 to 0.90:1; and

(e) the support comprises alumina.

8. The method of claim 7 wherein:

(a) the Group VIII metal is selected from cobalt, nickel and mixtures thereof; and

(b) the Group VIB metal is selected from chromium, tungsten and molybdenum and mixtures thereof.

9. The method of claim 6 wherein the catalyst having a high hydrodenitrogenation (HDN) selectivity for hydroprocessing of a petroleum feedstock exhibits a combination of hydrodenitrogenation (HDN) selectivity greater than 152% and relative metals tolerance of greater than 50%, wherein HDN selectivity is calculated as the ratio of the rate constant for hydrodenitrogenation to the rate constant for hydrodesulfurization (HDS), kHDN/kHDS, and metals tolerance is calculated as the time it takes for HDS activity to fall to 20% of its initial activity.

10. A supported catalyst comprising at least one metal containing catalyst component and at least one phosphorous containing catalyst component, wherein at least one metal in the metal containing catalyst component is a Group VIB metal of the Periodic Table of the Elements selected from chromium, tungsten and molybdenum, and at least one other metal in the metal containing catalyst component is a Group VIII metal Periodic Table of the Elements selected from cobalt, and nickel, and wherein said catalyst components are carried on a foraminous support, said catalyst being characterized as having:

(a) a Group VIII metal component to Phosphorous component molar ratio of from about 0.05:1 to about 0.59:1;

(b) a Group VIII metal component to Group VIB metal component molar ratio of from about 0.05 to about 0.44:1;

(c) a phosphorous component to Group VIB metal component molar ratio of from about 0.65:1 to 0.90:1;

(d) a median pore diameter of from about 80 to about 90Å; and

(e) a support comprising alumina; and

wherein:

(1) the surface area of the catalyst from about 150 to about 350 m^2/g; and

(2) the total pore volume of the support is from about 0.5 to about 1.1cc/g.