CLAIMS

1. A catalyst composition comprising: (i) a support; (ii) a dehydrogenation component comprising at least one metal or compound thereof selected from Groups 6 to 10 of the Periodic Table of Elements; and (iii) tin or a tin compound, wherein the tin is present in an amount of 0.01 wt% to ~~about~~ 0.25 wt%, the wt% based upon the total weight of the catalyst composition, further wherein the catalyst composition is prepared by sequential impregnation with the tin or tin compound being applied to the support before the dehydrogenation component, and further wherein the catalyst composition contains less than 0.1 wt% cobalt.

2. The catalyst composition of claim 1, wherein the tin is present in an amount of ~~about~~ 0.05 wt% to ~~about~~ 0.25 wt%, based upon the total weight of the catalyst composition.

3. The catalyst composition of claim 1 or claim 2, wherein ~~the tin is present in an amount of about 0.05 wt% to about 0.15 wt% of tin based upon the total weight of~~ the catalyst composition contains no cobalt.

4. The catalyst composition of ~~any one of the preceding claims~~ claim 3, wherein the support is selected from the group consisting of silica, a silicate, an aluminosilicate, zirconia, carbon, and carbon nanotubes.

5. The catalyst composition of ~~any one of the preceding claims~~ claim 3 or claim 4, wherein the dehydrogenation component comprises at least one of platinum, palladium and compounds thereof.

6. The catalyst composition of any one of ~~the preceding~~ claims 3-5, wherein the dehydrogenation component is present in an amount of greater than 0.01 wt% to ~~about~~ 2 wt%, based upon the total weight of the catalyst composition.

7. The catalyst composition of any one of the preceding claims, wherein the

composition provides a reduced selectivity to one or more of pentane, pentene and carbon monoxide.

8. A method for preparing a catalyst composition, the method comprising:

(a) treating a support with tin or a compound thereof;

(b) heating the treated support at a temperature of ~~about~~ 100°C to ~~about~~ 700°C; and

(c) impregnating the support with a dehydrogenation component comprising at least one metal or compound thereof selected from Groups 6 to 10 of the Periodic Table of Elements,

wherein the impregnating (c) is effected after ~~or at the same time as~~ the treating (a); and

wherein the final catalyst composition contains less than 0.1 wt% cobalt.

9. The method of claim 8, wherein the heating (b) is conducted in an oxygen-containing atmosphere.

10. The method of claim 8 or claim 9, and further comprising:

(d) heating the impregnated support at a temperature of ~~about~~ 100°C to ~~about~~ 700°C.

11. The method of claim 10, wherein the heating (d) is conducted in an oxygen-containing atmosphere at a temperature of 200°C to 500°C for a time of 1 to 10 hours.

12. The method of any one of claims 10-11, wherein the heating (d) is conducted in an oxygen-containing atmosphere at a temperature of ~~about 200°C to about 500°C~~ 300°C to 450°C for a time of ~~about~~ 1 to ~~about~~ 10 hours.

13. The method of any one of claims ~~10-12~~ 8-12, wherein the ~~heating (d) is conducted in an oxygen-containing atmosphere at a temperature of about 300°C to about 450°C for a time of about 1 to about 10 hours~~ final catalyst composition contains no cobalt.

14. The method of ~~any one of claims 8-13~~ claim 13, wherein the treating (a) comprises treating the support with a tin compound in an amount sufficient to provide greater than 0.01 wt% to ~~about~~ 0.25 wt% of tin based upon the total weight of the final catalyst composition.

15. The method of ~~any one of claims 8-14~~ claim 13 or claim 14, wherein the treating (a) comprises treating the support with a tin compound in an amount sufficient to provide ~~about~~ 0.05 wt% to ~~about~~ 0.25 wt% of tin based upon the total weight of the final catalyst composition.

16. The method of any one of claims ~~8-15~~ 13-15, wherein the treating (a) comprises treating the support with a tin compound in an amount sufficient to provide ~~about~~ 0.05 wt% to ~~about~~ 0.15 wt% of tin based upon the total weight of the final catalyst composition.

17. The method of any one of claims ~~8-16~~ 13-16, wherein the support is selected from the group consisting of silica, a silicate, an aluminosilicate, zirconia, carbon, and carbon nanotubes.

18. The method of any one of claims ~~8-17~~ 13-17, wherein the dehydrogenation component comprises at least one of platinum, palladium and compounds thereof.

19. The method of any one of claims ~~8-18~~ 13-18, wherein the support is impregnated with the dehydrogenation component in an amount sufficient to provide ~~about~~ 0.01 wt% to ~~about~~ 2 wt%, based upon the total weight of the final catalyst composition.

20. The method of any one of claims ~~8-19~~ 13-18, wherein the support is impregnated with the dehydrogenation component in an amount sufficient to provide ~~about~~ 0.5 wt% to ~~about~~ 1.5 wt%, based upon the total weight of the final catalyst composition.

21. A process for the dehydrogenation of a ketone to an aromatic alcohol, the process comprising contacting a feed comprising a cycloaliphatic alcohol or ketone under dehydrogenation conditions with catalyst composition comprising: (i) a support; (ii) a dehydrogenation component comprising at least one metal or compound thereof selected from Groups 6 to 10 of the Periodic Table of Elements; and (iii) tin or a tin compound, wherein the tin is present in an amount of 0.01 wt% to ~~about~~ 0.25 wt%, the wt% based upon the total weight of the catalyst composition, further wherein the catalyst composition is prepared by sequential impregnation with the tin or tin compound being applied o the support before the dehydrogenation component.

22. The process of claim 21, wherein said feed comprises cyclohexanone.

23. The process of claim 21 or claim 22, wherein said dehydrogenation conditions comprise a temperature of ~~about~~ 250°C to ~~about~~ 500°C, a pressure of ~~about~~ 100 kPa to ~~about~~ 3550 kPa, a weight hourly space velocity of ~~about~~ 0.2 hr^{-1} to 50 hr^{-1}, and a hydrogen to cyclohexanone-containing feed molar ratio of ~~about~~ 2 to ~~about~~ 20.

24. The process of any one of claims 21-23, wherein said at least one metal selected from Groups 6 to 10 of the Periodic Table of Elements comprises platinum, palladium and mixtures thereof.

25. A process for producing phenol from benzene, the process comprising:

(a) reacting benzene and hydrogen with a catalyst under hydroalkylation conditions to produce cyclohexylbenzene;

(b) oxidizing cyclohexylbenzene from (a) to produce cyclohexylbenzene hydroperoxide;

(c) converting cyclohexylbenzene hydroperoxide from (b) to produce an effluent steam comprising phenol and cyclohexanone; and

(d) contacting at least a portion of the effluent stream from (c) with a dehydrogenation catalyst comprising: (i) a support; (ii) a dehydrogenation component comprising at least one metal or compound thereof selected from Groups 6 to 10 of

the Periodic Table of Elements; and (iii) tin or a tin compound, wherein the tin is present in an amount of 0.01 wt% to ~~about~~ 0.25 wt%, the wt% based upon the total weight of the catalyst composition, and further wherein the catalyst composition is prepared by sequential impregnation with the tin or tin compound being applied to the support before the dehydrogenation component;

wherein the contacting occurs under dehydrogenation conditions effective to convert at least part of the cyclohexanone in the effluent stream into phenol and hydrogen.