We claim:

1. A multifunctional catalyst additive composition for reduction of carbon monoxide and nitrogen oxides in a fluid catalytic cracking process comprising:
   (i) an inorganic oxide material.
   (ii) at least 1% of alumino silicate or a zeolite;
   (iii) at least 0.001 % by weight of a noble metal;
   (iv) at least 0.01 % by weight of a metal of Group I A;
   (v) at least 0.01 % by weight of a metal of Group II A;
   (vi) at least 0.45% by weight of a metal of Group III A;
   (vii) at least 0.3% by weight of an element of Group IV A;
   (viii) at least 0.01 % by weight of at least a metal of Group V A;
   (ix) at least 0.05% by weight of a rare earth oxide;
   (x) at least 0.02% by weight of at least a metal of Group VIII;
   wherein said multifunctional additive composition is deposited on to a support and is attrition resistant.

2. The multifunctional catalyst additive composition as claimed in claim 1 wherein said support is a fresh support or discarded refinery catalyst from a cracking petroleum process.

3. The multifunctional catalyst additive composition as claimed in claim 2 wherein said fresh support comprises inorganic oxide or zeoilite with unimodal pore distribution having pores in the range of 20°A to 300°A, preferably in the range of 20 to 100°A, more preferably in the range of 20 to 60°A.

4. The composition as claimed in claim 2 wherein said discarded refinery catalyst comprises bimodal pore distribution having pores in the range of 20°A to 50°A and 80°A to 100°A.

5. The composition as claimed in claim 1, wherein said noble metal is Palladium in the range of 0.001 % to 1% by weight, wherein further said Palladium is in an elemental form uniformly distributed within the catalyst composition

6. The composition as claimed in claim 1, wherein said metal of Group IA is sodium in the range of 0.01 % to 0.25% by weight.

7. The composition as claimed claim 1, wherein said metal of Group IIA is magnesium in the range of 0.01 to 0.25% by weight.

8. The composition as claimed claim 1, wherein said metal of Group IIIA is aluminum in the range of 0.45 to 50% by weight.

9. The composition as claimed in claim 1, wherein said element of Group IVA is carbon in the range of 0.01 to 1.0% by weight.

10. The composition as claimed in claim 1, wherein said metals of Group V are vanadium or phosphorus, wherein said vanadium is in the range of 0.01 to 0.25% by weight or wherein said phosphorus is in the range of 0.1 to 0.7% by weight

11. The composition as claimed in claim 1, wherein said rare earth oxide is in the range of 0.05% to 1.2% by weight.

12. The composition as claimed in claim 1, wherein said metal of Group VIII are nickel or iron, wherein said nickel is in the range of 0.02 to 0.07% by weight or wherein said iron is in the range of 0.1 to 0.45% by weight

13. The composition as claimed in claim 1, wherein said alumino silicate or a zeolite is in the range of 1 to 56% by weight.

14. The composition as claimed in claim 1, wherein said inorganic oxide is alumina.

15. A process for preparing a multifunctional catalyst additive composition for reduction of carbon monoxide and nitrogen oxides in a fluid catalytic cracking process as claimed in claim 1, comprising the steps of:

i) incorporating by sequential impregnation or co impregnation or equilibrium adsorption metals selected from the group comprising Ni, V, Na, Fe, Mg or rare earth

metals into the support, wherein said support is a fresh support or discarded refinery catalyst from a cracking petroleum process;

ii) drying the said support by heating;

iii) incorporating a noble metal into the dried support;

iv) drying the support;

v) calcination of the support.

16. The process as claimed in claim 15, wherein said drying in step (ii) is by heating in glass reactor at 500°C in air for 4 Hrs.

17. The process as claimed in claim 15, wherein said noble metal is palladium and is incorporated into dried support either before or after carbon removal by equilibrium adsorption or wet impregnation method either at room temperature or at slightly above room temperature preferably below 40° C.

18. The process as claimed in claim 15, wherein said drying in step (iv) is at 110°C to 120°C for eight to sixteen hours.

19. The process as claimed in claim 15, wherein said calcination of the support is at 450°C to 500°C for three to four hours.

20. The process as claimed claim 15, wherein said discarded refinery catalyst contains carbon in the range of 0.3-1.0 wt%, is burned either before or after incorporation of metals preferably in a controlled atmosphere in presence of either oxygen or air preferably 1% oxygen and heating at a rate of 2°C per minute.

21. The process as claimed in any of the claims 15 to 20, wherein the coke burned and Palladium deposited in the discarded catalyst support is subjected to high temperature wherein said high temperature is raised in 2°C per min up to 400°- 600° C in air or in inert atmosphere such as nitrogen.

22. The process as claimed claim 15, comprising the steps of:

i) incorporating by sequential impregnation or co impregnation or equilibrium adsorption metals selected from the group comprising Ni, V, Na, Fe, Mg or rare earth metals into the support;

ii) drying the support by heating in glass reactor at 500°C in air for 4 hours wherein said support is a fresh support or discarded refinery spent catalyst from a cracking petroleum process with an average particle size of about 60-80 microns and said discarded refinery spent catalyst contains carbon in the range of 0.3-1.0 wt%;

iii) incorporating the noble metal palladium into the dried support by equilibrium adsorption or wet impregnation method either at room temperature or at slightly above room temperature preferably below 40°C;

iv) drying the support at 110°C to 120°C for eight to sixteen hours;

v) calcination of the support at 450°C to 500°C for three to four hours.

23. A fluid cracking catalyst comprising the multifunctional catalyst additive composition as claimed in any one of claims 1 to 14 and preferably prepared by the process as claimed in any one of claims 15 to 22, wherein said catalyst is attrition resistant, has no dilution effect on cracking and reduces carbon monoxide and nitrogen oxides in a fluid catalytic cracking process

We claim:

1. A multifunctional catalyst additive composition for reduction of carbon monoxide and nitrogen oxides in a fluid catalytic cracking process comprising:
   (i) an inorganic oxide material.
   (ii) at least 1% by weight of alumino silicate or a zeolite;
   (iii) 0.001 % to 1% by weight of Palladium;
   (iv) at least 0.01 % by weight of a metal of Group I A;
   (v) at least 0.01 % by weight of a metal of Group II A;
   (vi) at least 0.45% by weight of a metal of Group III A;
   (vii) at least 0.3% by weight of an element of Group IV A;
   (viii) at least 0.01 % by weight of a metal of Group VB;
   (ix) at least 0.05% by weight of a rare earth oxide;
   (x) at least 0.02% by weight of a metal of Group VIII;
   wherein said multifunctional additive composition is deposited on to a support and is attrition resistant.

2. The multifunctional catalyst additive composition as claimed in claim 1 wherein said support is a fresh support or discarded refinery catalyst from a cracking petroleum process.

3. The multifunctional catalyst additive composition as claimed in claim 2 wherein said fresh support comprises inorganic oxide or zeoilite with unimodal pore distribution having pores in the range of 20°A to 300°A.

4. The multifunctional catalyst additive composition as claimed in claim 3 wherein said fresh support comprises inorganic oxide or zeoilite with unimodal pore distribution having pores in the range of 20 to 100°A.

5. The multifunctional catalyst additive composition as claimed in claim 4 wherein said fresh support comprises inorganic oxide or zeoilite with unimodal pore distribution having pores in the range of 20 to 60°A.

6. The composition as claimed in claim 2 wherein said discarded refinery catalyst comprises bimodal pore distribution having pores in the range of 20°A to 50°A and 80°A to 100°A.

7. The composition as claimed in any one of claims 1-6, wherein Palladium is in an elemental form uniformly distributed within the catalyst composition.

8. The composition as claimed in any one of claims 1-7, wherein said metal of Group IA is sodium in the range of 0.01 % to 0.25% by weight.

9. The composition as in any one of claims 1-8, wherein said metal of Group IIA is magnesium in the range of 0.01 to 0.25% by weight.

10. The composition as in any one of claims 1-9, wherein said metal of Group IIIA is aluminum in the range of 0.45 to 50% by weight.

11. The composition as claimed in any one of claims 1-10, wherein said element of Group IVA is carbon in the range of 0.3 to 1.0% by weight.

12. The composition as claimed in any one of claims 1-11, wherein said metals of Group VB are vanadium, wherein said vanadium is in the range of 0.01 to 0.25% by weight.

13. The composition as claimed in any one of claims 1-12, wherein said rare earth oxide is in the range of 0.05% to 1.2% by weight.

14. The composition as claimed in any one of claims 1-13, wherein said metal of Group VIII are nickel or iron, wherein said nickel is in the range of 0.02 to 0.07% by weight or wherein said iron is in the range of 0.1 to 0.45% by weight

15. The composition as claimed in any one of claims 1-14, wherein said alumino silicate or a zeolite is in the range of 1 to 56% by weight.

16. The composition as claimed in any one of claims 1-15, wherein said inorganic oxide is alumina.

17. A process for preparing a multifunctional catalyst additive composition for reduction of carbon monoxide and nitrogen oxides in a fluid catalytic cracking process as claimed in claim 1, comprising the steps of:

i) incorporating by sequential impregnation or co impregnation or equilibrium adsorption metals selected from the group comprising Ni, V, Na, Fe, Mg or rare earth metals into the support, wherein said support is a fresh support or discarded refinery catalyst from a cracking petroleum process;

ii) drying the said support by heating;
iii) incorporating palladium into the dried support;
iv) drying the support;
v) calcination of the support.

18. The process as claimed in claim 17, wherein said drying in step (ii) is by heating in glass reactor at 500°C in air for 4 Hrs.

19. The process as claimed in claim 17 or 18, wherein said palladium is incorporated into dried support either before or after carbon removal by equilibrium adsorption or wet impregnation method either at room temperature or below 40° C.

20. The process as claimed in any one of claims 17-19, wherein said drying in step (iv) is at 110°C to 120°C for eight to sixteen hours.

21. The process as claimed in any one of claims 17-20, wherein said calcination of the support is at 450°C to 500°C for three to four hours.

22. The process as claimed in any one of claims 17-21, wherein said discarded refinery catalyst contains carbon in the range of 0.3-1.0 wt%, is burned either before or after incorporation of metals in a controlled atmosphere in presence of either oxygen or air and heating at a rate of 2°C per minute.

23. The process as claimed in any of the claims 17 to 22, wherein the coke burned and Palladium deposited in the discarded catalyst support is subjected to high temperature wherein said high temperature is raised in 2°C per min up to 400°- 600° C in air or in inert atmosphere.

24. The process as claimed claim 17, comprising the steps of:
    i) incorporating by sequential impregnation or co impregnation or equilibrium adsorption metals selected from the group comprising Ni, V, Na, Fe, Mg or rare earth metals into the support;
    ii) drying the support by heating in glass reactor at 500°C in air for 4 hours wherein said support is a fresh support or discarded refinery spent catalyst from a cracking petroleum process with an average particle size of 60-80 microns and said discarded refinery spent catalyst contains carbon in the range of 0.3-1.0 wt%;

iii) incorporating the noble metal palladium into the dried support by equilibrium adsorption or wet impregnation method either at room temperature or below 40°C;

iv) drying the support at 110°C to 120°C for eight to sixteen hours;

v) calcination of the support at 450°C to 500°C for three to four hours.

25. A fluid cracking catalyst comprising the multifunctional catalyst additive composition as claimed in any one of claims 1 to 16 and prepared by the process as claimed in any one of claims 17 to 24, wherein said catalyst is attrition resistant, has no dilution effect on cracking and reduces carbon monoxide and nitrogen oxides in a fluid catalytic cracking process