CLAIMS

1. A gas phase carbonylation catalyst comprising:
-at least one element from group VIII of the periodic table,
-an anchor consisting of one element from the lanthanide series; and
- an inert support,
wherein the anchor binds the at least one element from group VIII of the periodic table to the inert support.

2. The catalyst of claim 1, wherein the at least one element from group VIII and the one element from the lanthanide series are in an oxide form.

3. The catalyst of claim 1 or 2, wherein the at least one element from group VIII is iron, ruthenium, osmium, hassium, cobalt, rhodium (Rh), iridium, nickel, palladium, or platinum.

4. The catalyst of any one of claims 1-3, wherein the one element from the lanthanide series is lanthanum (La).

5. The catalyst of claim 1, said catalyst comprising rhodium (Rh) and lanthanum (La).

6. The catalyst of claim 5, wherein the catalyst comprises a Rh-La dispersion greater than 80%.

7. The catalyst of any one of claims 1-4, wherein the at least one element from group VIII is cobalt, rhodium, iridium, nickel, and a mixture thereof.

8. The catalyst of claim 7, wherein said catalyst comprises rhodium-cobalt, nickel-rhodium, rhodium-iridium, iridium-cobalt, iridium-nickel, or nickel-cobalt; preferably rhodium-cobalt-iridium.

9. The catalyst of any one of claims 1-8, wherein the catalyst comprises between 0.01wt% to 1wt% of the at least one element from group VIII compared to the total weight of the catalyst.

10. The catalyst of any one of claims 1-9, further comprising at least one transition metal; and/or further comprising at least one promotor from group III of the periodic table.

11. The catalyst of claim 10, wherein the promotor is scandium, yttrium, an actinide or a mixture thereof.

12. The catalyst of any one of claims 10-11, wherein the catalyst comprises between 0.01wt% to 1wt% of the promotor from Group III compared to the total weight of the catalyst.

13. The catalyst of claim 5, wherein the catalyst comprises 0.6% Rh-0.4% La or 0.2% Rh-0.2% La.

14. The catalyst of any one of claims 1-13, wherein the support is an activated carbon, a zeolite, alumina, or a mixture thereof.

15. A process for carbonylation of methanol comprising the step of reacting in a gas phase in a carbonylation reactor the methanol, carbon monoxide in the presence of the catalyst of any one of claims 1-14, producing a mixture of methyl acetate, acetic acid, water, unreacted methanol and dimethyl ether (DME).