WHAT IS CLAIMED IS:

1. A method of converting a carbonaceous material into synthesis gas comprising:

    a) gasifying the carbonaceous material in a fluidized bed, producing a crude syngas;

    b) classifying the crude syngas by particle aerodynamic velocity into a cut sizing device producing classified crude syngas comprising classified particles with a range of particle diameter and density;

    c) introducing said classified crude syngas into a thermal reformer; and

    d) reforming said classified crude syngas at a temperature above mineral melting point, producing the synthesis gas.

2. The method of claim 1, wherein the cut sizing device is a freeboard enlargement, a cyclone, a perforated shroud, a helical strakes, a longitudinal slats, a filter, a cascade impactor, an aerodynamic classifier or any combination thereof.

3. The method of claim 1 or 2, wherein the carbonaceous material is fed to the fluidized bed reactor by a feeding system.

4. The method of any one of claims 1-3, wherein the fluidized bed reactor comprises a fluidized bed material selected from the group consisting of alumina, limestone, dolomite, sand, olivine, anthracite, desulfurized petroleum coke or a combination thereof.

5. The method of any one of claims 1-4, wherein a fluidizing agent is used to heat up the fluidized bed reactor and feed oxygen to gasification of the carbonaceous material.

6. The method of claim 5, wherein the fluidizing agent is air, oxygen, carbon dioxide, nitrogen, steam or any combination thereof.

7. The method of any one of claims 1-6, wherein the carbonaceous material is gasified at a temperature of about 450^{o}C to about 800^{o}C.

8. The method of any one of claims 1-7, wherein the carbonaceous material is gasified at a temperature of about 500^{o}C to about 700^{o}C.

9. The method of any one of claims 1-8, wherein the reforming operating temperature is of about 1200^{o}C to about 2000^{o}C.

10. The method of claim 9, wherein air, oxygen, carbon dioxide, nitrogen, steam or any combination in any proportion thereof is fed to the reformer to increase the temperature of said reformer.

11. The method of any one of claims 1-10, wherein the classified crude syngas is reformed at a temperature of about 1200°C to about 1800°C.

12. The method of any one of claims 1-11, wherein the reformer comprises a cooling wall membrane.

13. The method of claim 12, wherein the cooling wall membrane is made of studded pipes.

14. The method of any one of claims 1-13, wherein the carbonaceous material is converted into syngas with at least 78% of carbon conversion rate.

15. The method of any one of claims 1-14, wherein the carbonaceous material is converted into syngas with at least 90% of carbon conversion rate.

16. The method of any one of claims 1-15, wherein the carbonaceous material is converted into syngas with at least 96% of carbon conversion rate.

17. The method of any one of claims 1-16, wherein the carbonaceous material is a liquid, a solid and/or a gas containing carbon.

18. The method of any one of claims 1-17, wherein the carbonaceous material is a biomass.

19. The method of claim 18, wherein the biomass is an homogeneous biomass, a non-homogenous biomass, a non-homogeneous biomass, a heterogeneous biomass, urban biomass, or a combination thereof.

20. The method of claim 19, wherein the homogenous biomass is from a coniferous tree, a deciduous tree, an agricultural material, a primary sludge, waste cooking oil, lychee fruit bark or stillage.

21. The method of claim 19, wherein the non-homogenous biomass is from mixed forest residues, or mixed tree residues.

22. The method of any one of claims 1-19, wherein the carbonaceous material comprises a plastic, a metal, an inorganic salt, an organic compound, industrial wastes, recycling facilities rejects, automobile fluff, municipal solid waste, ICI waste, C&D waste, refuse derived fuel (RDF), solid recovered fuel, sewage sludge, used wood utility poles, wood railroad ties, wood, tire, synthetic textile, carpet, synthetic rubber, materials of fossil fuel

origin, expanded polystyrene, poly-film floc, construction wood material, or any combination thereof.

23. A method of converting a carbonaceous material into a chemical comprising:

a) gasifying the carbonaceous material in a fluidized bed, producing a crude syngas;

b) classifying the crude syngas by particle aerodynamic velocity into a cut sizing device producing classified crude syngas comprising classified particles with a range of particle diameter and density;

c) introducing said classified crude syngas into a thermal reformer;

d) reforming said classified crude syngas at a temperature above mineral melting point, producing the synthesis gas; and

e) converting said synthesis gas into methanol in a methanol reactor, producing methanol.

24. The method of claim 23, further comprising the steps of:

f) reacting the methanol with carbon monoxide (CO) in a carbonylation reactor to methyl acetate; and

g) feeding said methyl acetate into an hydrogenolysis reactor and reacting said methyl acetate with hydrogen (H_2) producing ethanol, methanol, ethyl acetate or a combination thereof.