CLAIMS

1. A process of controlling the morphology of graphite in a process for the production of graphite, the process comprising:

   contacting at elevated temperature, a metal oxide catalyst with a hydrocarbon gas to catalytically convert at least a portion of the hydrocarbon gas to hydrogen and carbon;

   wherein the temperature is between 700 °C and 900 °C and a pressure between 0 bar(g) and 8 bar(g), and wherein both the temperature and the pressure are set within predetermined value ranges to selectively synthesise graphitic material with a desired morphology selected from the group consisting of: carbon nano-onions (CNOs).

2. A process according to claim 1, wherein the metal oxide catalyst is an iron oxide catalyst.

3. A process according to claim 2, wherein the iron oxide catalyst is selected from Fe_2O_3 and Fe_3O_4 or any mixture thereof.

4. A process according to claim 2, wherein the iron oxide catalyst is selected from hematite iron ore and goethite iron ore or any mixture thereof.

5. A process according to any one of claims 1 to 4, wherein the metal oxide catalyst is unsupported.

6. A process according to any one of claims 1 to 4, wherein the metal oxide catalyst is supported on a support.

7. A process according to claim 6, wherein the support is of the same chemical composition as the metal oxide catalyst.

8. A process according to any one of claims 1 to 7, wherein the hydrocarbon gas is methane.

9. A process according to any one of claim 1 to 7, wherein the hydrocarbon gas is natural gas.

10. A process according to any one of claims 1 to 9, wherein the temperature is 800 °C to 900 °C and the pressure is 2 bar(g) to 4 bar(g).