15. The method of any one of claims 7 to 12, wherein the method further comprises the step of adding an M^{2+} solution and a base to the product of the reaction between carbon dioxide and water, wherein M is selected from Ca and Mg, or a mixture of the two.

16. The method of claim 13 or claim 15, wherein the M^{2+} solution is an MCl_2 solution.

17. The method of claim 14 or claim 15, wherein the base is an alkali metal hydroxide

18. The method of claim 17, wherein the base is NaOH.

19. The method of any one of claims 7 to 18, the method further comprising the step of separating the nickel nanoparticles, nanowires or nanofibres from the product of the reaction between carbon dioxide and water.

20. The method of any one of claims 7 to 19, wherein the method is continuous.

21. A method of reducing the amount of carbon dioxide which enters the atmosphere from combustion, the method comprising reacting carbon dioxide with water in the presence of nickel nanoparticles, nanowires or nanofibres; wherein the carbon dioxide has been produced by combustion.

22. A method of producing calcium carbonate and/or magnesium carbonate; the method comprising:

reacting carbon dioxide with water in the presence of nickel nanoparticles, nanowires or nanofibres; and

adding a base and a M^{2+} solution to the product of the reaction between carbon dioxide and water, wherein M is selected from Ca and Mg, or a mixture of the two.

23. An apparatus for capturing carbon dioxide, the apparatus comprising:

a hydration tank containing a liquid comprising water and nickel nanoparticles, nanowires or nanofibres in contact with the liquid; and

a means for bubbling CO_2 through the liquid.

24. A method of hydrating carbon dioxide; characterised in that nickel nanoparticles, nanowires or nanofibres are used as a catalyst.

~~25. A use of a solid metal as a catalyst for the hydration of carbon dioxide, wherein the solid metal is a solid which comprises Ni.~~

26. A method of capturing carbon dioxide; the method comprising reacting carbon dioxide with water in the presence of a solid metal catalyst wherein the solid metal is a solid which comprises Ni.

27. A method of increasing the rate of hydration of carbon dioxide; the method comprising reacting carbon dioxide with water in the presence of a solid metal catalyst wherein the solid metal is a solid which comprises Ni.