Claims

1. A method for processing water treatment residuals, for use in the manufacture of hydraulic binders, comprising heating the water treatment residuals in a heating chamber to remove water and oxidise organic material contained therein, wherein the temperature of the water treatment residuals is controlled during heating such that they are heated to a temperature no higher than 800°C, wherein air is added to the heating chamber at a rate adapted to ensure that substantially all organic material in the residuals are oxidised.

2. A method as claimed in claim 1,
comprising controlling the temperature of the water treatment residuals such that they are heated to a temperature no higher than 700°C, more preferably no higher than 650°C.

3. A method as claimed in claim 1,
comprising controlling the temperature of the water treatment residuals such that they are heated to a temperature between 350°C and 650°C.

4. A method as claimed in claim 1,
comprising controlling the temperature of the water treatment residuals such that they are heated to a temperature between 400°C and 500°C.

5. A method as claimed in claim 1,
wherein the temperature of the water treatment residuals is controlled during heating such that amorphous aluminium oxide and/or aluminium hydroxide present in the residuals remains in its amorphous state.

6. A method as claimed in claim 1,
wherein the temperature of the water treatment residuals being controlled by the

addition of air and/or water to the chamber and/or by controlling a supply of heat to the heating chamber.

7. A method as claimed in claim 1,
wherein the residuals within the heating chamber are heated indirectly by heating an exterior of the heating chamber.

8. A method as claimed in claim 7,
wherein the exterior of the heating chamber is heated by means of burners acting directly on the exterior of the heating chamber.

9. A method as claimed in claim 7,
wherein the heating chamber is located within a heating jacket receiving hot gases from a burner.

10. A method as claimed in claim 1,
wherein the water treatment residuals are at least partially dewatered prior to heating.

11. A method as claimed in claim 10,
wherein the water treatment residuals are dewatered via a mechanical process.

12. A method as claimed in claim 11,
wherein the water treatment residuals are dewatered in a belt dryer or rotary dryer.

13. A method as claimed in any of claims 10 to 12,
wherein the water treatment residuals are dewatered to have a water content of between 20% and 40%.

14. A method as claimed in claim 1,

wherein the water treatment residuals are milled or ground after heating to a particle size of 40 microns or approximately 40 microns.

15. A method as claimed in claim 1,

wherein the water treatment residuals are hydrated after heating to convert amorphous aluminium oxide to amorphous aluminium hydroxide.

16. A method as claimed in claim 1,

wherein the water treatment residuals are mixed with a source of calcium ions and a source of sulphate ions in the presence of water to form ettringite.

17. A method as claimed in claim 16,

wherein the water treatment residuals are mixed with Portland cement, hydrated lime and calcium sulphate in the presence of water.

18. A method as claimed in claim 1,

wherein the water treatment residuals are mixed with a source of calcium ions in the presence of water.

19. An apparatus for processing water treatment residuals for use in the manufacture of hydraulic binders, comprising a heating chamber within which the residuals can be heated, means for heating the heating chamber and means for controlling the temperature therein, wherein the apparatus comprises air supply means for adding air to the heating chamber at a rate to ensure that substantially all organic material in the residuals can be oxidised.

20. An apparatus as claimed in claim 19,

wherein the heating chamber is heated by burners acting against an outer wall of the heating chamber.

21. An apparatus as claimed in claim 19,

wherein the heating chamber is heated by ducting hot gases from a combustion chamber into a heating jacket surrounding the heating chamber.

22. An apparatus as claimed in claim 21,

wherein combustion gases from the heating means are used to pre-heat the air added to the heating chamber.

23. An apparatus as claimed in claim 19,

wherein the heating chamber is adapted to be rotated during heating.

24. An apparatus as claimed in claim 19,

wherein the heating chamber comprises a tubular drum mounted for rotation about a longitudinal axis and having an inlet at one end and an outlet and an opposite end.

25. An apparatus as claimed in claim19,

further comprising a dewatering means upstream of the heating chamber for reducing the water content of the water treatment residuals.

26. An apparatus as claimed in claim 19,

further comprising a milling and/or grinding means downstream of the heating chamber for reducing the particle size of the water treatment residuals after heating.

27. An apparatus as claimed in claim 19,

wherein the temperature control means is adapted to limit the temperature of the water treatment residuals to no more than 700°C.

28. An apparatus as claimed in claim 19,

wherein the temperature control means is adapted to limit the temperature of the water treatment residuals to no more than 650°C.

29. An apparatus as claimed in claim 19,

wherein the temperature control means is adapted to control the temperature of the water treatment residuals in the heating chamber to between 350°C and 650°C.

30. An apparatus as claimed in claim 19,

wherein the temperature control means is adapted to control the temperature of the water treatment residuals in the heating chamber to between 400°C and 500°C.

31. An apparatus according to claim 19,

wherein the apparatus is configured to perform the method according to any of the previous claims 1 to 18.