WE CLAIM

1. A method of making a plastic aggregate, the method comprising

providing a granulated waste plastic material,

introducing the granulated waste plastics into an extruder having a die, the die having a ratio of die nozzle open area to die land area of 1:10 to 1:40, and

extruding the granulated waste plastic material through the extruder to generate an extruded plastic aggregate,

treating the extruded plastic aggregate by

i) cooling the extruded plastic aggregate, or

ii) coating the plastic aggregate, or

iii) both (i) and (ii)

to provide the extruded plastic aggregate.

2. A method of claim 1 wherein one or more additives are added to the granulated waste plastics during melting of the granulated waste plastic material, and wherein the one or more additives are selected from the group comprising sand, pozzolanic materials, calcium carbonate, micro silica and glass.

3. A method of claim 1 or 2 wherein the method comprises a step of cooling the extrudate immediately after or during egress from the die.

4. A method of claim 3 wherein extrudate is cooled after egress from the die by the addition of a controlled cooling aid, and wherein the controlled cooling aid is selected from the group comprising sand, pozzolanic materials, calcium carbonate, micro silica and glass.

5. A method of claim 3 or 4 wherein the extrudate is cooled for 1 to 20 minutes to yield an aggregate having a density of between 200 to 400 kg/m^3.

6. A method of claim 3 or 4 wherein the extrudate is cooled for 10 to 70 minutes to yield an aggregate having a density of between 400 to 500 kg/m^3.

7. A method according to any of claims 1 to 6 wherein the land length of the die is 10 to 70 mm.

8. A method of any one of claims 1 to 7 wherein the extruded plastic aggregate has a specific gravity of 0.90 to 1.15.

9. A method of any one of claims 1 to 8 wherein the extruder is a single rotational axis extruder.

10. A method of any one of claims 1 to 9 wherein the extruding surface of the die comprises at least three surfaces, and the die is star shaped.

11. An extruded plastic aggregate as an at least partial replacement for metal aggregate in concrete, the plastic aggregate having:

a size of 1 to 30 mm, and

a specific gravity of 0.90 to 1.15, and

a surface texture that is macroscopically roughened and has a high surface area to promote both mechanical and/or molecular bonding, and

wherein the plastic aggregate has been formed by extrusion using an extruder having a die with a ratio of die nozzle open area to die land area of 1:10 to 1:40.

12. The extruded plastic aggregate of claim 11, wherein when in use in a concrete composition, the plastic aggregate has a bond strength within the concrete resulting in the concrete having a compressive strength of 10 to 50 MPa.

13. The extruded plastic aggregate of claim 11 or 12 wherein for an 20 mm aggregate the extruded plastic aggregate comprises a surface area to volume ratio of 1 to 1.9.

14. A method of making concrete, the method comprising

providing an extruded plastic aggregate from granulated waste plastic material, the extruded plastic aggregate being produced in an extruder having a ratio of die nozzle open area to die land area of 1:10 to 1:40,

combining 18 to 60% by weight cement, 5 to 50% by weight water, 0 to 40% by weight of one or more additives and 5 to 40% by weight extruded plastic aggregate to form an aggregate- concrete mixture.

15. A method of claim 14, wherein the aggregate-concrete mixture provides a concrete having a compressive strength of at least 10 to 50 MPa.

16. A method according to claim 14 or 15, wherein the one or more additives are selected from the group comprising sand and aggregates.