CLAIMS

1. A method of making particles, the method comprising:

obtaining a supply of mixed plastic waste treated with a preconditioning agent that comprises at least one of calcium oxide and calcium hydroxide to improve sanitation of the mixed plastic waste;

mixing the supply of mixed plastic waste treated with the preconditioning agent with one or more additives to form a plastic waste mixture, the one or more additives comprising pozzolans;

hot extruding the plastic waste mixture to form an extruded product comprising waste plastic material; and

processing the extruded product to form an aggregate in which the waste plastic material is exposed at exterior surfaces thereof.

2. The method of claim 1 wherein the supply of mixed plastic waste includes a variety of plastic materials including at least one of high density polyethylene, polypropylene, PVC, ABS, polyurethane, polyamide, and PET.

3. The method of one of the preceding clams wherein the supply of mixed plastic waste treated by the preconditioning agent includes at least 50% waste plastic material by weight, and

wherein the supply of mixed plastic waste includes at least some non-plastic material in the form of food residue, cellulosic material and/or metallic foil material.

4. The method of one of the preceding claims wherein the supply of plastic waste is characterized by mixed waste plastic having a granule size less than 25mm obtained by shredding and/or pulverizing mixed plastic waste products, or

wherein the supply of mixed plastic waste has a bulk density that is at least five times greater than a bulk density of mixed plastic waste products from which the mixed plastic waste is derived.

5. The method of one of the preceding claims wherein the supply of mixed plastic waste treated by the preconditioning agent includes 4% to 22% calcium compounds by weight.

6. The method of one of the preceding claims wherein, prior to the mixing the supply of mixed plastic waste treated with the preconditioning agent with the one or more additives, at least some calcium oxide of the preconditioning agent in the supply of mixed plastic waste is converted to calcium hydroxide through exposure to moisture.

7. The method of one of the preceding clams, further comprising:

prior to the mixing the supply of mixed plastic waste treated with the preconditioning agent with the one or more additives, blending the supply of mixed plastic waste treated with the preconditioning agent with a supplemental supply of mixed plastic waste from a different source.

8. The method of one of the preceding claims wherein the pozzolans mixed with the mixed plastic waste treated with the preconditioning agent comprises burned organic matter residues.

9. The method of one of the preceding claims wherein the plastic waste mixture to be hot extruded includes 2% to 14% of pozzolans by weight, or

wherein the plastic waste mixture to be hot extruded includes 6% to 18% of calcium compounds by weight, or

wherein the plastic waste mixture to be hot extruded includes at least 50% plastic material by weight, or

wherein the plastic waste mixture is hot extruded at a processing temperature between 165°C and 230°C.

10. The method of one of the preceding claims wherein the one or more additives of the plastic waste mixture further comprises at least of an essence, a fire retardant, and an anti-bacterial agent.

11. The method of one of the preceding claims wherein the plastic waste mixture has a moisture content sufficient to assist in forming cavities within the extruded product during the hot extruding of the plastic waste mixture.

12. The method of one of the preceding claims wherein the plastic waste mixture to be hot extruded consists essentially of the plastic waste treated with the preconditioning agent and the pozzolans.

13. Particles formed by the process of:

obtaining a supply of mixed plastic waste treated with a preconditioning agent that comprises at least one of calcium oxide and calcium hydroxide;

mixing the supply of mixed plastic waste treated with the preconditioning agent with one or more additives to form a plastic waste mixture, the one or more additives comprising pozzolans;

hot extruding the plastic waste mixture to form an extruded product comprising waste plastic material; and

processing the extruded product to form an aggregate in which the waste plastic material is exposed at exterior surfaces thereof.

14. A concrete product including particles formed by the process of claim 13.

15. Particles formed by the process of claim 13, wherein the process further comprises:

prior to the mixing the supply of mixed plastic waste treated with the preconditioning agent with the one or more additives, blending the supply of mixed plastic waste treated with the preconditioning agent with a supplemental supply of mixed plastic waste from a different source.

16. Particles formed by the process of claim 13, wherein the plastic waste mixture to be hot extruded consists essentially of the plastic waste treated with the preconditioning agent and the pozzolans.

17. A method of making a concrete construction product, the method comprising:

obtaining an aggregate formed by hot extruding a plastic waste mixture comprising comingled mixed plastics, a preconditioning agent that comprises at least one of calcium oxide and calcium hydroxide, and pozzolans, cooling the extruded product, and processing the extruded product to a desired size of particles;

mixing the particles with a cement mixture to form a concrete mixture;

mixing the concrete mixture with water to generate a concrete slurry; and

forming the concrete slurry into the concrete construction product.

18. The method of claim 17 wherein forming the concrete slurry into the concrete construction product includes forming the concrete slurry into a construction block.

19. The method of claim 17, wherein mixing the particles with the cement mixture includes replacing at least some of a volume of sand in the cement mixture with the particles.

20. The method of claim 17, wherein the desired size of the particles is similar to a size of sand particles for the cement mixture.