CLAIMS:

1. A sand aggregate comprising:

plural aggregate grains,

wherein at least one aggregate grain of the plural aggregate grains includes,

desert sand grains that are too small to be used in concrete applications;

carbonate particles distributed on and attached to an external surface of the desert sand grains; and

a sand-based glue that aggregates the desert sand grains having the carbonate particles, to form the at least one aggregate grain,

wherein the at least one aggregate grain has a size comparable to river sand grains, while the desert sand grains have a size smaller than the river sand grains so that the at least one aggregate grain is suitable for concrete applications, and

wherein the sand-based glue is obtained from additional desert sand grains being treated with a base.

2. The aggregate of Claim 1, wherein the desert sand grains and the additional desert sand grains have a same origin.

3. The aggregate of Claim 1, wherein the desert sand grains have an average length less than 1 mm while the river sand grains have an average length larger than 1 mm.

4. The aggregate of Claim 1, wherein an average volume and an average surface area of the river sand grain is about 2.17 mm^3 and 9.32 mm^2, respectively, while for the desert sand grain is about 929.378.2 μm^3 and 49,913.6 μm^2, respectively.

5. The aggregate of Claim 1, wherein an average volume per desert sand grain is smaller than half of an average volume of the river sand grain.

6. The aggregate of Claim 5, wherein an average surface area per desert sand grain is smaller than half or one fourth or one tenth of an average surface area of the river sand grain.

7. The aggregate of Claim 1, wherein the carbonate particles include $CaCO_3$ and the carbonate particles include one of Li, Mg, Zn, Fe, Ba, Sr, or Na.

8. A method for transforming desert sand grains into conforming sand for concrete applications, the method comprising:

providing the desert sand grains;

treating the desert sand grains with a carbon dioxide capturing agent to produce enhanced sand grains;

carbonating the enhanced sand grains to generate carbonate enhanced sand grains and simultaneously storing carbon dioxide on the exterior surface of the carbonate enhanced sand grains, wherein the carbonate enhanced sand grains

include carbonate particles attached to an external surface of the desert sand grains; and

aggregating the carbonate enhanced sand grains with a sand-based glue to form a sand aggregate, which is a conforming sand for concrete applications and has similar sizes as river sand grains, wherein the sand-based glue is obtained from fine desert sand grains treated with a base.

9. The method of Claim 8, wherein the desert sand grains are too small to be used in concrete applications.

10. The method of Claim 8, further comprising:

separating fine desert sand grains from the carbonate enhanced sand grains; and

treating the separated fine desert sand grains with a base to form a sand-based glue.

11. The method of Claim 10, further comprising:

adding the sand-based glue to the step of aggregating to form the sand aggregate.

12. The method of Claim 8, wherein the desert sand grains have an average length less than 1 mm while the river sand grains have an average length larger than 1 mm.

13. The method of Claim 8, wherein an average volume per desert sand grain is smaller than half of an average volume of the river sand grain.

14. The method of Claim 13, wherein an average surface area per desert sand grain is smaller than half or one fourth or one tenth of an average surface area of the river sand grain.

15. The method of Claim 8, wherein the carbonate particles include $CaCO_3$ and the carbonate particles include one of Li, Mg, Zn, Fe, Ba, Sr, or Na.