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CLAIMS

What is claimed is:

- 5 1. A coated diamond particle, comprising:
a solid core comprising diamond; and
at least one graphene layer over at least a portion of the solid core.
2. The coated diamond particle of claim 1, further comprising at least
10 one additional layer formed over at least a portion of the solid core.
3. The coated diamond particle of claim 2, wherein the at least one
graphene layer comprises two or more graphene layers separated by the at least one
additional layer.
- 15 4. The coated diamond particle of claim 2, wherein the at least one
additional layer comprises two or more additional layers separated by the at least one
graphene layer.
- 20 5. The coated diamond particle of any of claims 1 through 4, further
comprising a carbon shell.
6. The coated diamond particle of any of claims 1 through 4, wherein
the coated diamond particle has a diameter of about 500 nm or less.
- 25 7. A method, comprising:
coating a diamond particle with a charged species; and
coating the diamond particle with a graphene layer.

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8. The method of claim 7, further comprising coating the diamond particle with a material selected from the group consisting of group VIII-A elements and alloys thereof.

5 9. The method of claim 7 or claim 8, further comprising immersing the diamond particle in a solution comprising an oppositely charged species before coating the diamond particle with a graphene layer.

10 10. The method of claim 7 or claim 8, further comprising catalyzing the formation of an inter-granular bond between the diamond particle and another diamond particle.

11. A composition, comprising:
a substance; and
15 a plurality of coated diamond particles dispersed within the substance, each coated diamond particle having a diamond core and at least one graphene layer formed over at least a portion of the diamond core.

20 12. The composition of claim 11, wherein the substance comprises a fluid, and wherein the coated diamond particles are suspended in the fluid.

25 13. The composition of claim 11, wherein the substance comprises a solid material, and wherein the coated diamond particles are dispersed throughout the solid material.

14. The composition of claim 13, wherein the solid material comprises a second plurality of diamond particles.

30 15. The composition of claim 14, wherein the plurality of coated diamond particles has a first average diameter and the second plurality of diamond particles has a second average diameter different from the first average diameter.

16. The composition of claim 14 or claim 15, further comprising a catalyst material disposed in interstitial spaces between the plurality of coated diamond particles and the second plurality of diamond particles.

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17. The composition of claim 14 or claim 15, wherein at least one of the plurality of coated diamond particles and the second plurality of diamond particles comprises a plurality of diamond particles having at least one layer comprising a material selected from the group consisting of cobalt, iron, nickel, and alloys thereof.

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CLAIMS

What is claimed is:

1. A coated diamond particle, comprising:
a solid core comprising diamond;
a charged species over at least a portion of the solid core;
at least one graphite layer over the charged species; and
at least one graphene layer over at least a portion of the at least one graphite layer.
2. A coated diamond particle, comprising:
a solid core comprising diamond;
a plurality of graphene layers over at least a portion of the solid core; and
at least one additional layer between two graphene layers of the plurality of graphene layers, the
at least one additional layer comprising at least one material selected from the group
consisting of Group VII-A elements, carbonate materials, nonmetallic diamond catalysts,
ceramics, and refractory metals.
3. The coated diamond particle of claim 1, wherein the at least one graphene layer
comprises two or more graphene layers separated by at least one additional layer, the at least one
additional layer comprising at least one material selected from the group consisting of Group
VII-A elements, carbonate materials, nonmetallic diamond catalysts, ceramics, and refractory
metals.
4. The coated diamond particle of claim 2, wherein the at least one additional layer
comprises two or more additional layers separated by at least one of the plurality of graphene
layers.
5. The coated diamond particle of claim 1, further comprising at least one non-
crystalline carbon layer, wherein the at least one non-crystalline carbon layer comprises a carbon
shell.

6. The coated diamond particle of claim 1, wherein the coated diamond particle has a diameter of about 500 nm or less.

7. A composition, comprising:
a substance; and
a plurality of coated diamond particles dispersed within the substance, each coated diamond particle having a diamond core, a charged species over at least a portion of the diamond core, at least one graphite layer over the charged species, and at least one graphene layer formed over at least a portion of the at least one graphite layer.

8. The composition of claim 7, wherein the substance comprises a fluid, and wherein the coated diamond particles are suspended in the fluid.

9. The composition of claim 7, wherein the substance comprises a solid material, and wherein the coated diamond particles are dispersed throughout the solid material.

10. A composition, comprising:
a first plurality of diamond particles; and
a second plurality of diamond particles;
wherein one of the first plurality of diamond particles or the second plurality of diamond particles comprises a plurality of coated diamond particles having at least one graphite layer over a diamond core and at least one graphene layer over the graphite layer, the first plurality of diamond particles and the second plurality of diamond particles being interspersed.

11. The composition of claim 10, wherein the first plurality of diamond particles has a first average diameter and the second plurality of diamond particles has a second average diameter different from the first average diameter.

12. The composition of claim 10, further comprising a catalyst material disposed in interstitial spaces between the first plurality of diamond particles and the second plurality of diamond particles.

13. The composition of claim 10, wherein at least one of the first plurality of diamond particles and the second plurality of diamond particles comprises a plurality of diamond particles having at least one layer comprising a material selected from the group consisting of cobalt, iron, nickel, and alloys thereof.

14. The composition of claim 10, wherein at least one of the first plurality of diamond particles and the second plurality of diamond particles comprises a plurality of diamond particles having at least one layer comprising magnesium carbonate.

15. The composition of claim 10, wherein at least one of the first plurality of diamond particles and the second plurality of diamond particles comprises a plurality of diamond particles having at least one layer comprising a material selected from the group consisting of ceramics and refractory metals.

16. The composition of claim 10, further comprising:
a first layer; and
a second layer;
wherein the first layer and the second layer each comprise a plurality of diamond particles having at least one graphene layer, and wherein the plurality of diamond particles of the first layer has a different average diameter from an average diameter of the plurality of diamond particles of the second layer.

17. The coated diamond particle of claim 1, wherein the charged species comprises a positively charged amine-terminated group.

18. The coated diamond particle of claim 2, wherein the at least one additional layer comprises at least one material selected from the group consisting of carbonates of magnesium, calcium, strontium, and barium.

19. The coated diamond particle of claim 2, wherein the at least one additional layer comprises silicon.

20. The coated diamond particle of claim 2, wherein the at least one additional layer comprises at least one element selected from the group consisting of iron, cobalt, and nickel.