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Claims

1. A method of forming activated carbon, comprising:
 - a) mixing carbon black with an activation catalyst in a polar solvent to form a mixture; and
 - b) heating the mixture at about 350 °C to about 500 °C in order to form the activated carbon;wherein the weight ratio of carbon black to activation catalyst is of about 1:0.1 to about 1:0.5; and
- wherein the activation catalyst is selected from ammonium persulfate, sodium persulfate, potassium persulfate or a combination thereof.
2. The method according to claim 1, wherein the mixture is heated at about 400 °C for at least 3 h.
3. The method according to claims 1 or 2, wherein the solvent is selected from water, ethanol, ethylene glycol or a combination thereof.
4. The method according to any one of claims 1 to 3, wherein the solvent is a mixture of water and ethanol at a weight ratio of 85:15, a mixture of water and ethylene glycol at a weight ratio of 85:15, or a mixture of ethanol and ethylene glycol at a weight ratio of 85:15.
5. The method according to any one of claims 1 to 4, wherein the weight ratio of carbon black to solvent is about 1:5 to about 1:100.
6. The method according to any one of claims 1 to 5, wherein the mixture is mixed for at least 1 h.
7. The method according to any one of claims 1 to 6, further comprising adding a co-catalyst to the mixture.

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8. The method according to claim 7, wherein the co-catalyst is mixed with the mixture for at least 3 h.
- 5 9. The method according to claims 7 or 8, wherein the co-catalyst is ammonia or ammonium hydroxide.
10. The method according to any one of claims 7 to 9, wherein the weight ratio of the activation catalyst to the co-catalyst is about 1:0.1.
- 10 11. The method according to any one of claims 1 to 10, wherein the pH of the mixture is maintained at about 7 to about 9.
12. The method according to any one of claims 1 to 11, wherein the mixture is heated at
15 a rate of about 1 °C/min to about 5 °C/min.
13. The method according to any one of claims 1 to 12, further comprising a step after step (a) of drying the mixture.
- 20 14. A method of forming silane functionalised activated carbon, comprising:
 - a) mixing carbon black with a silane agent and an activation catalyst in a polar solvent to form a mixture; and
 - b) heating the mixture at about 350 °C to about 500 °C in order to form the silane functionalised activated carbon;
25 wherein the weight ratio of carbon black to activation catalyst is of about 1:0.1 to about 1:0.5; and
wherein the activation catalyst is selected from acetic acid and/or ammonia.
15. The method according to claim 14, wherein the mixture is stirred for at least 3 h at
30 room temperature.

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16. The method according to claims 14 or 15, wherein the mixture is heated at about 350 °C for at least 6 h.
17. The method according to any one of claims 14 to 16, wherein the weight ratio of carbon black to silane agent is of about 1:0.18 to about 1:0.25.
18. The method according to any one of claims 14 to 17, wherein the weight ratio of silane agent to catalyst is of about 1:0.5 to about 1:1.7.
19. The method according to any one of claims 14 to 18, wherein the silane agent is selected from bistrithoxysilane (1,2-bis(triethoxysilyl)ethane), 1,2-Bis(trichlorosilyl)ethane, 1,2-Bis(trimethoxysilyl)ethane or a combination thereof..
20. An activated carbon formed from the method according to any one of claims 1 to 13.
21. The activated carbon according to claim 20, having a particle size of about 40 nm to about 80 nm.
22. The activated carbon according to claims 20 or 21, having a BET surface area of more than 600 m²/g.
23. The activated carbon according to any one of claims 20 to 22, having a pore diameter of at least 1.5 nm.
24. The activated carbon according to any one of claims 20 to 23, having a dye adsorption of at least 170 mg/g.
25. A silane functionalised activated carbon formed from the method according to any one of claims 14 to 19.
26. The silane functionalised activated carbon accordingly to claim 25, having a particle

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size is about 140 nm to about 500 nm.

27. The silane functionalised activated carbon according to claims 25 or 26, comprising at least 4 carbon particles.
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28. The silane functionalised activated carbon according to any one of claims 25 to 27, having a silica shell with a thickness of about 10 nm on at least a surface of the activated carbon.
- 10 29. The silane functionalised activated carbon according to any one of claims 25 to 28, having a BET surface area of more than 600 m²/g.