Claims

What is claimed is:

1. An adsorbent comprising an activated carbonaceous material, wherein said activated carbonaceous material comprises:

(i) micropores, said micropores comprising primary micropores having pore widths greater than 0 nm and less than 0.8 nm and secondary micropores having pore widths greater than 0.8 nm and less than 2 nm,

(ii) mesopores, and

(iii) macropores,

wherein the activated carbonaceous material possesses a surface area ratio of micropores to mesopores measured using t-plot method of greater than or equal to 13 to less than or equal to 17.

2. The adsorbent of claim 1, wherein a pore volume ratio of (primary micropores) **:** (secondary micropores plus mesopores) measured using DFT method is greater than or equal to 0.4 and less than or equal to 1.4.

3. The adsorbent of claim 1 or 2, wherein the activated carbonaceous material is a granular activated carbon.

4. An adsorbent comprising an activated carbonaceous material, wherein said activated carbonaceous material comprises:

(i) micropores, said micropores comprising primary micropores having pore widths greater than 0 nm and less than 0.8 nm and secondary micropores having pore widths greater than 0.8 nm and less than 2 nm,

(ii) mesopores, and

(iii) macropores,

wherein the activated carbonaceous material possesses a pore volume ratio of (primary micropores) **:** (secondary micropores plus mesopores) measured using DFT method of greater than or equal to 0.4 and less than or equal to 1.4.

5. The adsorbent of claim 4, wherein the activated carbonaceous material is a granular activated carbon.

6. The adsorbent of any preceding claim, wherein the material has a surface area measured using BET method of greater than or equal to 500 to less than or equal to 1400 m^2/g.

7. The adsorbent of any preceding claim, wherein the surface area ratio of micropores to mesopores measured using t-plot method is greater than or equal to 13 to less than or equal to 15.

8. The adsorbent of any preceding claim, wherein the pore volume ratio of (primary micropores) **:** (secondary micropores plus mesopores) using DFT method is greater than or equal to 0.5 to less than or equal to 1.4.

9. The adsorbent of any preceding claim, wherein the pore volume ratio of (primary micropores) : (secondary micropores plus mesopores) using DFT method is greater than or equal to 0.9 and less than or equal to 1.35.

10. An adsorbent comprising an activated carbonaceous material, wherein said activated carbonaceous material has been treated with a solution of an acid having a pKa from 1 to 5 at a concentration of 0.05 to 0.5M, and washed with water.

11. The adsorbent of claim 10, wherein the activated carbonaceous material has been treated with a solution of an acid having a pKa from 1 to 5 at a concentration of 0.05 to 0.15M in water.

12. The adsorbent of claim 10 or 11, wherein the acid is a mineral acid or an organic acid.

13. The adsorbent of any of claims 10 to 12, wherein the acid is a mineral acid chosen from hydrochloric acid, sulfuric acid, phosphoric acid, hydrobromic acid, and nitric acid.

14. The adsorbent of any of claims 10 to 13, wherein the acid is sulfuric acid.

15. A filter comprising the adsorbent of any preceding claim.

16. A method for removing a contaminant from a gas stream, the method comprising:
contacting the gas stream with the adsorbent of any of claims 1 to 14,
wherein the contaminant is chosen from:
(i) C_1-C_{20} alkyl silanols,
(ii) C_1-C_{20} silanols substituted by one or more halogen atoms, or
(iii) compounds of the formula $(R)_3Si\text{-}O\text{-}Si(R)_3$,
wherein R is chosen from C_1-C_{20} alkyl or C_1-C_{20} alkyl substituted by one or more halogen atoms.

17. The method of claim 16, wherein the gas stream is comprised of a gas chosen from air, nitrogen, oxygen, or an inert gas.

18. The method of claim 16 or 17, wherein the contaminant is chosen from trimethyl silanol, triethyl silanol, tripropyl silanol, triiospropyl silanol, and tributyl silanol.

19. The method of any of claims 16 to 18, wherein the contaminant is a compound chosen from:
$(CH_3)_3Si\text{-}O\text{-}Si(CH_3)_3$; $(CH_3CH_2)_3Si\text{-}O\text{-}Si(CH_2CH_3)_3$; hexamethylcyclotrisiloxane, octamethyltrisiloxane, octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, decamethyltetrasiloxane, dodecamethylpentasiloxane, dodecamethylcyclohexasiloxane, or any combination thereof.