CLAIMS

1. A composite filter material for removing contaminants from water, wherein said composite filter material is made up of a base filter material with a surface area; and

wherein said surface area of said base filter material is at least partially coated with a thin layer of poly dopamine (PDA); and

wherein said thin layer of poly dopamine (PDA)is at least partially coated with a thin layer of metal; and

wherein said thin layer of metal is at least partially oxidized; and

wherein said thin layer of partially oxidized metal is at least partially coated with a thin layer of octadecylamine (ODA).

2. The composite filter material of Claim 1, wherein the said base filter material comprises one of a solid granular particle, a porous granular particle, a porous membrane, an ultrafine mesh or a network of solid or porous fibers.

3. The composite filter material of Claim 2, wherein the said base filter material comprises granular activated carbon.

4. The composite filter material of Claim 1, wherein the said base filter material comprises a porous granular particle.

5. The composite filter material of Claim 4, wherein the said porous granular particle is microporous.

6. The composite filter material of Claim 4, wherein the said porous granular particle is macroporous.

7. The composite filter material of Claim 4, wherein the said porous granular particle is mesoporous.

8. The composite filter material of Claim 4, wherein the said porous granular particle contains varied amounts of all three types of porosity.

9. The composite filter material of Claim 1, wherein the said thin layer of metal comprises at least partially oxidized iron.

10. The composite filter material of Claim 1, wherein the said thin layer of metal comprises one of iron, a transition metal, an alkali metal, an alkaline earth metal, a rare earth metal or another metal from Group 13, 14 or 15 of the periodic table of the elements.

11. A method of removing and disposing of contaminants from water, the steps of said method comprising:

placing a quantity of the composite filter material of Claim 1 in contaminated water and leaving said composite filter material in the mixture of said contaminated water and said composite filter material for a period of time; and

removing said composite filter material from said mixture; and

placing said composite filter material into clean water making a second mixture, heating said second mixture, and keeping said second mixture at an elevated temperature for approximately 1 day; and

removing said composite filter material from said mixture, leaving an effluent; and

placing and sealing said effluent from the second mixture in a photocatalytic reaction chamber with a UV light source and either of titanium dioxide@ferric oxide nanoparticles or titanium dioxide nanoparticles; and

causing said UV light to be turned on and said photocatalytic reaction chamber to be shaken at 250 to 400 RPM for at least 24 hours; and

placing said recovered composite filter material in an appropriate storage medium for future reprocessing as needed.