CLAIMS

1. An odor control system comprising:

a source of air contaminated with a sulfur-containing compound; and

a UV oxidation reactor having an inlet in fluid communication with the source of contaminated air, the reactor including:

a source of UV radiation disposed within the reactor; and

a reflective coating disposed on internal surfaces of the reactor.

2. The system of claim 1, wherein the source of air comprises a wastewater treatment plant.

3. The system of claim 1, wherein the reflective coating comprises porous PTFE.

4. The system of claim 3, wherein the reflective coating has a reflectivity of greater than about 97% for UV radiation.

7. The system of claim 1, further comprising a source of moisture in fluid communication with the inlet.

8. The system of claim 1, wherein the source of UV radiation is a source of UV-C radiation.

9. The system of claim 8, wherein the sulfur-containing compound comprises H_2S.

10. The system of claim 9, wherein the source of UV-C radiation provides sufficient UV-C radiation to oxidize sufficiently all H_2S in air having a concentration of H_2S of between about 60 ppm and about 70 ppm within about two seconds.

11. The system of claim 1, wherein the reactor further comprises a baffle which is substantially transparent to UV radiation.

12. The system of claim 11, wherein the baffle is at least partially coated with a layer of photocatalyst which is substantially transparent to UV radiation.

13. A method of facilitating the oxidation of a sulfur-containing contaminant in air, the method comprising:

providing a photooxidation reactor including:

a source of actinic radiation disposed within the reactor; and

a reflective coating including porous PTFE disposed on internal surfaces of the reactor; and

providing instructions to direct air contaminated with the sulfur-containing contaminant from a source of the contaminated air into the photooxidation reactor.

14. The method of claim 13, wherein providing the instructions comprises providing instructions to direct contaminated air from a wastewater treatment plant into the photooxidation reactor.

15. The method of claim 14, further comprising providing instructions to control the humidity of the contaminated air directed into the photooxidation reactor to be within a predetermined range of between about 30% and about 95% relative humidity.

16. The method of claim 13, wherein providing the photoooxidation reactor including the source of actinic radiation disposed within the reactor comprises providing the photoooxidation reactor including a source of UV-C radiation disposed within the reactor.

17. The method of claim 13, further comprising providing instructions to monitor a concentration of the sulfur-containing contaminant in air output from the photooxidation reactor and to adjust an operating parameter of the photooxidation

reactor responsive to the concentration of the sulfur-containing contaminant being above a predetermined set point.

18. A reactor for the oxidation of sulfur-containing contaminants in air with actinic radiation, the reactor comprising:

an inlet and an outlet;

a source of actinic radiation disposed within the reactor;

a source of moisture in fluid communication with the inlet; and

a reflective coating including porous PTFE disposed on internal surfaces of the reactor.

19. The reactor of claim 18, further comprising a baffle which is substantially transparent to UV radiation.

20. The reactor of claim 19, wherein the baffle is at least partially coated with a layer of photocatalyst which is substantially transparent to UV radiation.

21. A method of facilitating a reduction in power to a photooxidation reactor to achieve a desired rate of contaminant oxidation, the method comprising coating internal surfaces of the photooxidation reactor with a reflective coating, the photooxidation reactor including the internal surfaces coated with the reflective coating exhibiting an equivalent rate of oxidation of one or more airborne contaminants with UV power reduced by between about 30% and about 50% as compared to a photooxidation reactor of a similar design but not including the reflective coating.

22. The method of claim 21, further comprising reducing a number of UV lamps in the photooxidation reactor by between about 30% and about 50%, the photooxidation reactor including the reduced number of UV lamps exhibiting an equivalent rate of oxidation of one or more airborne contaminants as compared to a

reactor of a similar design but not including the reflective coating and not having a reduced number of UV lamps.

CLAIMS

1. An odor control system comprising:

a source of air contaminated with a sulfur-containing compound; and

a UV oxidation reactor having an inlet in fluid communication with the source of contaminated air, the reactor including:

a source of UV radiation disposed within the reactor; and

a reflective coating disposed on internal surfaces of the reactor.

2. The system of claim 1, wherein the source of air comprises a wastewater treatment plant.

3. The system of claim 1, wherein the reflective coating comprises porous PTFE.

4. The system of claim 3, wherein the reflective coating has a reflectivity of greater than about 97% for UV radiation.

5. The system of claim 1, further comprising a source of moisture in fluid communication with the inlet.

6. The system of claim 1, wherein the source of UV radiation is a source of UV-C radiation.

7. The system of claim 6, wherein the sulfur-containing compound comprises H_2S.

8. The system of claim 7, wherein the source of UV-C radiation provides sufficient UV-C radiation to oxidize sufficiently all H_2S in air having a concentration of H_2S of between about 60 ppm and about 70 ppm within about two seconds.

9. The system of claim 1, wherein the reactor further comprises a baffle which is substantially transparent to UV radiation.

10. The system of claim 9, wherein the baffle is at least partially coated with a layer of photocatalyst which is substantially transparent to UV radiation.

11. A method of facilitating the oxidation of a sulfur-containing contaminant in air, the method comprising:

providing a photooxidation reactor including:

a source of actinic radiation disposed within the reactor; and

a reflective coating including porous PTFE disposed on internal surfaces of the reactor; and

providing instructions to direct air contaminated with the sulfur-containing contaminant from a source of the contaminated air into the photooxidation reactor.

12. The method of claim 11, wherein providing the instructions comprises providing instructions to direct contaminated air from a wastewater treatment plant into the photooxidation reactor.

13. The method of claim 12, further comprising providing instructions to control the humidity of the contaminated air directed into the photooxidation reactor to be within a predetermined range of between about 30% and about 95% relative humidity.

14. The method of claim 11, wherein providing the photoooxidation reactor including the source of actinic radiation disposed within the reactor comprises providing the photoooxidation reactor including a source of UV-C radiation disposed within the reactor.

15. The method of claim 11, further comprising providing instructions to monitor a concentration of the sulfur-containing contaminant in air output from the photooxidation reactor and to adjust an operating parameter of the photooxidation

reactor responsive to the concentration of the sulfur-containing contaminant being above a predetermined set point.

16. A reactor for the oxidation of sulfur-containing contaminants in air with actinic radiation, the reactor comprising:

an inlet and an outlet;

a source of actinic radiation disposed within the reactor;

a source of moisture in fluid communication with the inlet; and

a reflective coating including porous PTFE disposed on internal surfaces of the reactor.

17. The reactor of claim 16, further comprising a baffle which is substantially transparent to UV radiation.

18. The reactor of claim 17, wherein the baffle is at least partially coated with a layer of photocatalyst which is substantially transparent to UV radiation.

19. A method of facilitating a reduction in power to a photooxidation reactor to achieve a desired rate of contaminant oxidation, the method comprising coating internal surfaces of the photooxidation reactor with a reflective coating, the photooxidation reactor including the internal surfaces coated with the reflective coating exhibiting an equivalent rate of oxidation of one or more airborne contaminants with UV power reduced by between about 30% and about 50% as compared to a photooxidation reactor of a similar design but not including the reflective coating.

20. The method of claim 19, further comprising reducing a number of UV lamps in the photooxidation reactor by between about 30% and about 50%, the photooxidation reactor including the reduced number of UV lamps exhibiting an equivalent rate of oxidation of one or more airborne contaminants as compared to a

reactor of a similar design but not including the reflective coating and not having a reduced number of UV lamps.