WHAT IS CLAIMED IS:

1. A method of treating a gas stream in a tailgas treating process, the method comprising:

contacting the gas stream with a catalyst that was previously used in a hydrotreating process and that has been reactivated by a reactivation process prior to contacting the gas stream in the tailgas treating process, wherein

the gas stream comprises one or more sulfur-containing species selected from the group consisting of elemental sulfur (S_x), sulfur dioxide (SO_2), carbonyl sulfide (COS), and carbon disulfide (CS_2), and wherein

contacting the gas stream with the reactivated catalyst in the presence of hydrogen (H_2) converts the one or more sulfur-containing species to hydrogen sulfide (H_2S),

wherein the catalyst comprises

either cobalt and molybdenum supported on aluminum oxide;

or nickel and molybdenum supported on aluminum oxide,

wherein the reactivation process comprises regeneration or rejuvenation,

wherein the regeneration comprises heating the catalyst in an oxygen-containing atmosphere at a temperature of 300 to 500 °C for a time of 30 minutes or more, and

wherein the rejuvenation comprises impregnating the catalyst with a solution containing a chelating agent and drying the catalyst at a temperature of 50°C to 300°C, and

wherein one or more of the following steps is performed:

(i) the reactivated catalyst is resized, reshaped, and/or reformulated prior to contacting the gas stream in the tailgas treating process,

(ii) the reactivated catalyst is combined with a second catalyst before contacting the gas stream with the reactivated catalyst, wherein the second catalyst provides a lower pressure drop than the reactivated catalyst,

(iii) the reactivated catalyst is short loaded when contacting the gas stream with the reactivated catalyst.

2. The method of claim 1, wherein the hydrotreating process is selected from the group consisting of petroleum hydrotreating processes, hydrodesulfurization (HDS), hydrodenitrogenation (HDN), hydrogenation, hydrodemetallization (HDM), naphtha

hydrotreating (NHT), diesel hydrotreating (DHT), kerosene hydrotreating (KHT), jet fuel hydrotreating (JHT), atmospheric gas oil hydrotreating, vacuum gas oil (VGO) hydrotreating, and fluid catalytic cracker (FCC) feed hydrotreating.

3. The method of claim 1, wherein prior to the regeneration treatment, hydrocarbons are removed from the catalyst by solvent extraction or by contacting the catalyst with steam, natural gas combustion products, hydrogen or nitrogen at a temperature of 150 to 550 °C.

4. The method of claim 1, wherein the chelating agent is an organic acid.

5. The method of claim 1, wherein the reactivated catalyst is pre-sulfurized prior to contacting the gas stream in the tailgas treating process.

6. The method of claim 1, wherein the reactivated catalyst is pre-sulfided prior to contacting the gas stream in the tailgas treating process.

7. The method of claim 1, wherein the reactivated catalyst is resized by length grading the catalyst.

8. The method of claim 1, wherein the reactivated catalyst is resized by sieving or screening the catalyst.

9. The method of claim 1, wherein the resizing, reshaping, and/or reformulating comprises milling the reactivated catalyst to a fine powder and then reforming the reactivated catalyst.

10. The method of claim 1, wherein the reactivated catalyst is resized from having a diameter of 1.3 to 2.5 mm to having a diameter of 3 to 5 mm.

11. The method of claim 1, wherein the reactivated catalyst exhibits a pressure drop of 0.05 to 0.20 psi/ft, when sock-loaded and tested at 100 ft/min superficial velocity in ambient air.

12. A method of forming a reactivated catalyst for a tailgas treating process, the method comprising:

obtaining a spent catalyst from a hydrotreating process, and

reactivating the catalyst to form the reactivated catalyst,

wherein the reactivated catalyst, when contacted with a gas stream comprising one or more sulfur-containing species selected from the group consisting of elemental sulfur (Sx), sulfur dioxide (SO_2), carbonyl sulfide (COS), and carbon disulfide (CS_2), is capable of catalyzing the conversion of the one or more sulfur-containing species to hydrogen sulfide (H_2S) in the presence of hydrogen (H_2),

wherein the reactivating comprises regeneration or rejuvenation,

wherein the regeneration comprises heating the catalyst in an oxygen-containing atmosphere at a temperature of 300 to 500 °C for a time of 30 minutes or more,

wherein the rejuvenation comprises impregnating the catalyst with a solution containing a chelating agent and drying the catalyst at a temperature of 50°C to 300°C,

wherein the reactivated catalyst is resized, reshaped, and/or reformulated, and

wherein the catalyst comprises

either cobalt and molybdenum supported on aluminum oxide;

or nickel and molybdenum supported on aluminum oxide.

13. The method of claim 12, wherein the hydrotreating process is selected from the group consisting of petroleum hydrotreating processes, hydrodesulfurization (HDS), hydrodenitrogenation (HDN), hydrogenation, hydrodemetallization (HDM), naphtha hydrotreating (NHT), diesel hydrotreating (DHT), kerosene hydrotreating (KHT), jet fuel hydrotreating (JHT), atmospheric gas oil hydrotreating, vacuum gas oil (VGO) hydrotreating, and fluid catalytic cracker (FCC) feed hydrotreating.

14. The method of claim 12, wherein, prior to the regeneration, removing hydrocarbons from the catalyst by solvent extraction or by contacting the catalyst with steam, natural gas combustion products, hydrogen or nitrogen at a temperature of 150 to 550 °C.

15. The method of claim 12, wherein the chelating agent is an organic acid.

16. The method of claim 12, further comprising pre-sulfurizing the reactivated catalyst.

17. The method of claim 12, further comprising pre-sulfiding the reactivated catalyst.

18. The method of claim 12, further comprising milling the reactivated catalyst to a fine powder and then reforming the reactivated catalyst.

19. The method of claim 12, wherein the spent catalyst, prior to reactivating, has a diameter of 1.3 to 2.5 mm and the reformed reactivated catalyst has a diameter of 3 to 5 mm.

20. The method of claim 12, wherein the spent catalyst, as used in the hydrotreating process, exhibits a pressure drop of 0.20 to 0.80 psi/ft, and wherein the method further comprises resizing, reshaping, and/or reformulating the reactivated catalyst so that the reactivated catalyst exhibits a pressure drop of 0.05 to 0.20 psi/ft, when sock-loaded and tested at 100 ft/min superficial velocity in ambient air.