Claims

1. A method for performing an oxidative decomposition treatment with ozone on a VOC and/or a gas-phase inorganic reducing compound in a gas, the method comprising adding, or mixing, or adding and mixing an ozone-comprising gas into or with a gas comprising as a target component, a VOC, or a gas-phase inorganic reducing compound, or a combination thereof, and then bringing a resultant mixed gas into contact with a packing material comprising as a base material, a silica adsorbent, which co-adsorbs the target component and ozone; and particulate powder of a transition metal-containing oxide, so that the target component is decomposed through ozone oxidation, wherein in the packing material, the particulate powder of a transition metal-containing oxide has a BET specific surface area in a range of 80 m^2/g or more and is carried on the base material, and the transition metal-containing oxide is a complex oxide of Co, Mn, and Cu.

2. The method for performing an oxidative decomposition treatment with ozone on a VOC and/or a gas-phase inorganic reducing compound in a gas according to claim 1, wherein the transition metal-containing oxide is the complex oxide of Co, Mn, and Cu, and the particulate powder of the complex oxide of Co, Mn, and Cu is formed of a precipitate obtained through co-precipitation performed by mixing an aqueous solution comprising salts of Co, Mn, and Cu, with an aqueous alkaline solution.

3. The method for performing an oxidative decomposition treatment with ozone on a VOC and/or a gas-phase inorganic reducing compound in a gas according to claim 1, wherein when an exhaust gas comprising the target component is brought into contact with the ozone, a ratio of a concentration of the ozone injected into the exhaust gas relative to a concentration of the target component calculated on a C1 basis, in the exhaust gas is in a range of more than 0.8.

4. The method for performing an oxidative decomposition treatment with ozone on a VOC and/or a gas-phase inorganic reducing compound in a gas according to claim 1, wherein the BET specific surface area is in a range of 100 m^2/g or more.

5. The method for performing an oxidative decomposition treatment with ozone on a VOC and/or a gas-phase inorganic reducing compound in a gas according to claim 1, wherein the silica adsorbent comprises at least one material selected from the group consisting of a silica pentasil zeolite, a dealuminized faujasite, and a mesoporous silicate.

6. The method for performing an oxidative decomposition treatment with ozone on a VOC and/or a gas-phase inorganic reducing compound in a gas according to claim 1, wherein the the target component is at least one material selected from the group consisting of ammonia, methyl mercaptan, hydrogen sulfide, methyl sulfide, trimethylamine, acetaldehyde, propionaldehyde, normal butyraldehyde, isobutyraldehyde, normal valeraldehyde, isovaleraldehyde, isobutanol, ethyl acetate, methyl isobutyl ketone, toluene, styrene, xylene, cyclohexanone, propionic acid, normal butyric acid, normal valeric acid, isovaleric acid, and carbon monoxide.

7. The method for performing an oxidative decomposition treatment with ozone on a VOC and/or a gas-phase inorganic reducing compound in a gas according to claim 1, wherein the packing material consists of: the silica adsorbent as a base material; and the particulate powder of the transition metal-containing oxide.