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ABSTRACT



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The present invention features a method employing the processes of adsorption and desorption for the treatment of exhaust gas containing volatile hydrocarbons, in which either a single layer of MPC pre-coated with volatile hydrocarbons is employed, or multiple-layers of such MPC and similarly pre-coated hydrophobic silica gel and/or synthetic zeolite are used as absorbent layers, and using a vacuum pump combined with purge gas for desorption, the adsorption-desorption switch-over time being set from 1 to 30 minutes, and the resulting purged exhaust gas is extracted to the outside of the system. Owing to such features, the present invention is capable of yielding clean gas substantially containing no volatile hydrocarbons when released into the atmosphere.

In addition, the present invention permits isolation and recovery of the targeted useful constituent in the case where the exhaust gas containing volatile hydrocarbons to be treated contains multi-constituent hydrocarbons with useful constituents, as well as the isolation and recovery of inert gas with a high level of purity for efficient reutilization in the case of inert gas containing gaseous impurities and/or contaminants.

Further, the employment of MPC pre-coated with volatile hydrocarbons as adsorbent presents another advantage, because within a normal range of humidity, such MPC does not selectively adsorb moisture, and instead adsorbs extremely low boiling point volatile hydrocarbons such as methane, ethylene and propylene at an outstanding performance level unparalleled by any other solid adsorbent.