

AUTOMATED INHALATION TOXICOLOGY EXPOSURE SYSTEM AND METHOD

CROSS-REFERENCE TO RELATED APPLICATION

The present patent application is a continuation-in-part of and hereby incorporated by reference in its entirety, U.S. patent application Ser. No. 09/919,741, entitled Automated Inhalation Toxicology Exposure System, filed Jul. 31, 2001, now U.S. Pat. No. 6,904,912 B2, and naming Chad J. Roy and Justin M. Hartings as inventors, which claims the benefit of U.S. Provisional Patent Application No. 60/267,233, filed Jan. 31, 2001, entitled Automated Inhalation Toxicology Exposure System, and naming Chad J. Roy and Justin M. Hartings as inventors; the present patent application also hereby incorporates by reference in its entirety any subject matter which was itself incorporated by reference into the previously-referenced U.S. patent application Ser. No. 09/919,741, entitled Automated Inhalation Toxicology Exposure System, such as U.S. Provisional Patent Application No. 60/267,233.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

This invention was made with government support. The government has certain rights in this invention.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present application relates, in general, to multi-animal inhalation exposure systems.

2. Description of the Related Art

Multi-animal inhalation exposure studies are generally performed using multi-animal inhalant systems. In multi-animal inhalation exposure studies, two or more animals are usually exposed to an organic or inorganic inhalant within the confined space of an inhalant chamber forming part of an inhalant system.

In the related art, a multi-animal inhalant system is typically one that provides mechanisms for exposing two or more animals to an inhalant. The inventors named herein ("inventors") have noticed several deficiencies and/or unmet needs associated with related-art multi-animal inhalant systems, a few of which will now be set forth (other related-art deficiencies and/or unmet needs will become apparent in the detailed description below).

The inventors have discovered that it would be advantageous for a multi-animal inhalant system to be able to condition an inhalant environment prior to exposing animals to the inhalant environment. The inventors have discovered that related-art multi-animal inhalant systems do not tend to provide for the conditioning of an inhalant environment prior to exposing the animals to the inhalant environment. The inventors have thus recognized that a need exists in the art for a multi-animal inhalant system that provides the ability to condition an inhalant environment prior to exposing the animals to the inhalant environment.

The inventors have discovered that it would be advantageous for a multi-animal inhalant system to be able to provide for differing exposure durations during which animals are exposed to the same inhalant environment. The inventors have discovered that related-art multi-animal inhalant systems do not tend to provide for differing exposure durations during which animals are exposed to the same

inhalant environment. The inventors have thus recognized that a need exists in the art for a multi-animal inhalant system that provides for differing exposure durations during which animals are exposed to the same inhalant environment.

The inventors have discovered that it would be advantageous for a multi-animal inhalant system to be able to provide control such that the exposure duration for each animal can be determined based on respiratory volume measurements. The inventors have discovered that related-art multi-animal inhalant systems do not tend to provide control such that the exposure duration for each animal can be determined based on respiratory volume measurements. The inventors have thus recognized that a need exists in the art for a multi-animal inhalant system that provides control such that the exposure duration for each animal can be determined based on respiratory volume measurements.

The inventors have discovered that it would be advantageous for a multi-animal inhalant system to be able to automatically control inhalant dose delivery and recording functions on an identified-animal basis. The inventors have discovered that related-art multi-animal inhalant systems do not automatically control inhalant dose delivery and recording functions on an identified-animal basis. The inventors have thus recognized that a need exists in the art for a multi-animal inhalant system that automatically controls inhalant dose delivery and recording functions on an identified-animal basis.

The foregoing-described inventor discoveries constitute at least a part of the inventive content herein.

BRIEF SUMMARY OF THE INVENTION

In one embodiment, a method includes but is not limited to: conditioning an inhalant environment; exposing a first organism to the inhalant environment for a first-organism duration of time; and exposing a second organism to the inhalant environment for a second-organism duration of time. In another method embodiment, said conditioning an inhalant environment is characterized by: introducing an inhalant into an inhalant manifold. In another method embodiment, said introducing an inhalant into an inhalant manifold is characterized by: introducing the inhalant into an inhalant intake plenum operably coupled with an inner manifold. In another method embodiment, said conditioning an inhalant environment is characterized by: monitoring at least one environmental condition selected from an environmental-condition group including temperature, relative humidity, pressure, and inhalant concentration. In another method embodiment, said conditioning an inhalant environment is characterized by: adjusting at least one environmental condition selected from an environmental-condition group including temperature, relative humidity, pressure, and inhalant concentration. In another method embodiment, said exposing a first organism to the inhalant environment for a first-organism duration of time is characterized by: coupling the inhalant environment to a first apertured connector, containing at least a part of the first organism, for the first-organism duration of time. In another method embodiment, said coupling the inhalant environment to a first apertured connector, containing at least a part of the first organism, for the first-organism duration of time is characterized by: starting the first-organism duration of time upon an initial coupling of the inhalant environment to the first apertured connector containing the at least a part of the first organism; and terminating the first-organism duration of time when a calculated first-organism delivered dosage