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Introduction

Compressed gases have many uses in laboratories, including cleaning, creating controlled environments for tissue cultures and incubators, and bubbling and drying samples.

Cylinders of compressed gases present a multitude of chemical and mechanical hazards to their users and to the occupants of laboratories. The type of gas involved should be considered for the following properties: flammability, reactivity, explosivity, corrosivity and asphyxiation potential. It should be noted that many gases are not necessarily chemical asphyxiants but may nonetheless result in asphyxiation via displacement of air.

Most gases, when vaporized, cause a cooling effect that may be sufficient to cause freezing of the skin and tissues. Gases also pose the risk of causing embolism if the gas stream is powerful enough to penetrate the skin and arteries. Cylinders have been referred to as "sleeping giants". The high pressures in compressed gas cylinders make cylinders potential bombs. If the gas is suddenly released, the resulting energy is sufficient to propel a cylinder through concrete walls.

Associated Procedure

1. All gas cylinders, full or empty, during transportation, storage or use, must be labelled accordingly and must be securely supported upright using racks, chains or stands.
2. When cylinders are not in use or when they are being transported, remove the regulator and attach the protective cap.
3. Avoid subjecting cylinders to temperature extremes.
4. Store full and empty cylinders separately. Serious cylinder contamination can occur when an empty cylinder is attached to a pressurized system causing reverse gas flow.
5. Avoid dragging, rolling or sliding cylinders. Move cylinders by using a suitable hand truck with a strap, chain or other device for securing the cylinder.
6. Never drop cylinders or permit them to strike each other violently.
7. Place cylinders where they will not become part of an electric circuit.
8. Bond and ground all cylinders, lines and equipment used with flammable compressed gases.

9. Use compressed gases only in a well-ventilated area, away from any source of ignition. Toxic, flammable and corrosive gases should be used in a fume hood. Only small cylinders of toxic gases should be used. Consider the use of flow restrictors in the cylinder valve to limit the rate of flow during an accidental release.
10. Use a trap or suitable check valve when discharging gas into a liquid to prevent liquid from getting back into the cylinder or regulator.
11. Use appropriate safety equipment such as safety goggles, face shield and rubber gloves when using corrosive gases.

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