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DRY ICE

THIRD EDITION

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Work Item 08-018
Carbon Dioxide Committee

NOTE—Technical changes from the previous edition are underlined.

THIRD EDITION: 2011
SECOND EDITION: 2004
FIRST EDITION: 1998

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1 Introduction

This publication is one of a series compiled by the Compressed Gas Association, Inc. (CGA) to satisfy the demand for information relative to the production, storage, transportation, safe handling, and use of compressed and liquefied gases, cryogenic liquids, and related products.

2 Scope

This publication provides information on dry ice (including physical and chemical properties, physiology, toxicity, special hazards, production, regulations, storage, handling, and applications) to users, producers, and distributors. More information on the various aspects of dry ice and its transportation and use may be found in the references cited in this publication, which are listed in Section 11.

3 Definitions

For the purpose of this publication, the following definitions apply.

3.1 Carbon dioxide
A chemical compound consisting of one atom of carbon bonded to two atoms of oxygen expressed by the chemical formula CO_2.

3.2 Critical point
The condition at which a material exists simultaneously as a liquid, gas, and supercritical fluid. For carbon dioxide, this occurs at a temperature of 87.9 °F (31.1 °C) and a pressure of 1056 psig (7280 kPa).[1, 2]

3.3 Critical pressure
The pressure that must be exerted to produce liquefaction at the critical temperature.

3.4 Critical temperature
The temperature above which a pure gas cannot be liquefied, regardless of the degree of compression.

3.5 Dry ice
The common name for solid carbon dioxide. Its temperature is –109.3 °F (–78.5 °C) at atmospheric pressure.

3.6 Saturated condition
The condition at which the pressure and temperature of all existing physical states are at equilibrium.

3.7 Sublimation
The process of changing from the solid phase directly to the gas phase without passing through the liquid phase.

3.8 Supercritical fluid
A substance that is at a pressure and a temperature equal to or greater than its critical point. A substance that has complete mutual solubility of the liquid and the gas.

3.9 Triple point
The temperature and pressure at which a material exists simultaneously as a solid, liquid, and gas.

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[1] kPa shall indicate gauge pressure unless otherwise noted as (kPa, abs) for absolute pressure or (kPa, differential) for differential pressure. All kPa values are rounded off per CGA P-11, *Metric Practice Guide for the Compressed Gas Industry* [1].

[2] References are shown by bracketed numbers and are listed in order of appearance in the reference section.