Hazards of carbon dioxide fire suppression system

Science, Chemistry

The risk associated with installing and using Carbon Dioxide as a fire suppressant in an occupied area lies in its adverse health effects to human physiology. For carbon dioxide to be effective as a total flooding fire suppressant, a minimum design of 34% concentration is needed. However, laboratory testing and simulation of carbon dioxide fire suppressant use indicate that concentrations greater than 17% results to loss of controlled and purposeful activity, convulsions, unconsciousness, coma and even death within 1 minute of initial inhalation (OSHA, 1999).

Even at 10-17% concentrations, carbon dioxide inhalation has been shown by Wong (1992) to result in drowsiness, severe muscle twitching and even unconsciousness. At 7 to 10 percent, headaches, visual and hearing dysfunction, hallucination and shortness of breath have been observed. At a minimum of 34% designed concentration for effectiveness, Carbon dioxide suppression systems are lethal. Any inadvertent discharge of the carbon dioxide in an occupied room can cause death quickly and without warning. The National Fire Protection Agency and the Occupational Safety and Health Authority have established guidelines such that human exposure does not occur during fire-fighting events but documented cases occurred during system installation, commissioning and maintenance because many of the servicemen lack the necessary knowledge and training.