

# Lake Nyos Demo

CO<sub>2</sub> is heavier than air, and can suffocate people and candles

## Chemicals and Equipment Needed

- d-H<sub>2</sub>O
- Dry ice
- Small dewar – **A3**
- Enclosed Staircase – **next to D**
- Small crystallizing dish – **P3**
- Rubber-tipped tongs – **U2**
- Stick Lighter – **U1**
- Tea lights – **N4**

## Hazards

- Dry ice is very cold, -79°C/-110°F. Do not handle dry ice with your bare hands
- Dry ice sublimates (goes from solid straight to gas), and carbon dioxide gas is colorless, odorless, and heavier than air. CO<sub>2</sub> can displace air along the floor.
- After the demo, place dry ice in the hood or a similar well-ventilated area to sublime.

## Preparation

- Check out the enclosed staircase and replace any candles that have burned down completely.
  - 1 or 2 candles per stair
- On delivery, fill the dish halfway with water and set on top step

## Presentation

- Starting at the bottom stair, light all the candles with the stick lighter
- Drop several pieces of dry ice into the crystallizing dish to quickly sublime the CO<sub>2</sub>. Close the side to contain the vapors.
- Because it is heavier and denser than air, the CO<sub>2</sub> will slowly flow down the stairs and extinguish the candles. Sometimes the candles on the very bottom stay lit.

## History

- Lake Nyos, in Cameroon, is a thermally stratified lake that is saturated with CO<sub>2</sub> (g). The gas usually remains on the bottom of the lake, in the coldest layer, and is relatively stable. In 1986, at least 300,000 tons of CO<sub>2</sub> were suddenly released from the lake. The gas flowed into a nearby valley and displaced all the air, suffocating 1700 people and 3500 livestock

## Clean-Up

- Blow out any remaining candles. Place beaker in sink to finish subliming, and to allow any ice formed to melt.