### Required Training

| UC Lab Safety Fundamentals |

### Required PPE

| Lab coat, safety glasses/goggles, nitrile gloves |

### Equipment

| DI Water Bottle |

| 2 Clean Balloons |

| Candle |

| Matches |

### Chemicals

### Procedure:

1) Put a small amount of water into a clean balloon and inflate to fairly large size.

2) Inflate a second balloon without any water to the same size.

3) Light a candle.

4) Hold the water-filled balloon over the candle (but do not touch it to the embers!) and it will not pop.

5) Holding the balloon without water over the candle will promptly pop it

### Discussion:

Heat Capacity is defined as the amount of heat required to change the temperature of a system by one degree. Specific heat capacity is defined as the amount of heat required to change one gram of a substance by one degree. As water is heated in first balloon, the heat of the candle only slowly raises the temperature of the water due to water’s high heat capacity. Conversely, the air inside the second balloon has a low heat capacity (about one quarter of water’s) and is quickly raised to a temperature at which the balloon fails.

### Hazards:
The sound when the balloon pops may be loud and hearing protection may be desired, however is not necessary. Be careful when dealing with matches and lit candles.

**SOP:**

N/A

**Disposal (by Storeroom):**

One can dispose of the balloons in the trash or given to the storeroom for disposal.

**Acknowledgements**

Chapter 7.2 in Petrucci, 8th Edition