22 FEB. 2013

MIC, JMA

Calibration of thermometer (practice)

- 0℃ (Ice point) -

1. Purpose

To learn calibration at 0℃ using ice point.

2. Goal

Estimate instrumental error at 0℃.

3. Calibrated items:

Liquid-in-glass thermometer: 3sets

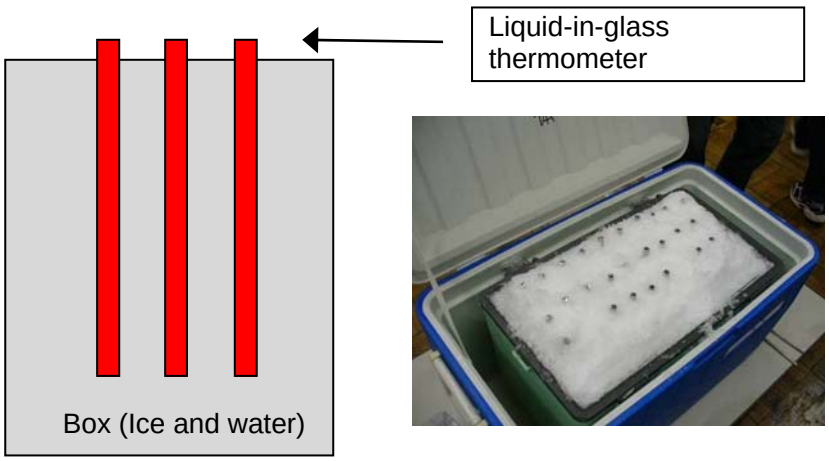
4. Work procedure

(1) Crush the ice to an appropriate size and place it in box.

(2) Set thermometers in the crushed ice.

(3) Read temperature values of thermometers three times.

(4) Fill the values in "Thermometers comparison form" (on paper and PC(Excel sheet)).



5. Notes

(1)Accuracy of Ice point even for commercially available ice is supporsed to be within 0.01℃ if carefully treated for contamination. Care must be taken, as a temperature of 0° C is not attained if the ice contains impurities, especially salt. Don't touch ice with bare hands and wash thermometers by clean water before calibration,

(2)The temperature of ice which is just after took out from refrigerator is below 0℃. Before crushing, ice has to be kept in room temperature at least until the surface of ice melts.

(3) Insert the thermometer vertically into the box and pack it with the crushed ice so that the entire unit is buried. However, do not insert it so deeply that the bulb reaches the bottom of the box.

(4)When packing with crushed ice, be sure to fill the box so that the ice comes into close contact with the bulb.

(5)Leave the thermometer in the ice for more than 10 minutes before reading the indication

(6) The observer ensures that the straight line from his/her eye to the index and read index as quickly as possible.

22 FEB. 2013

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Calibration of thermometer (practice)

- 30℃(Chamber)-

1. Purpose

To learn calibration at 30℃ using the chamber.

2. Goal

Estimate instrumental error and uncertainty at 30℃.

3. Calibrated items:

Liquid-in-glass thermometer : 1set

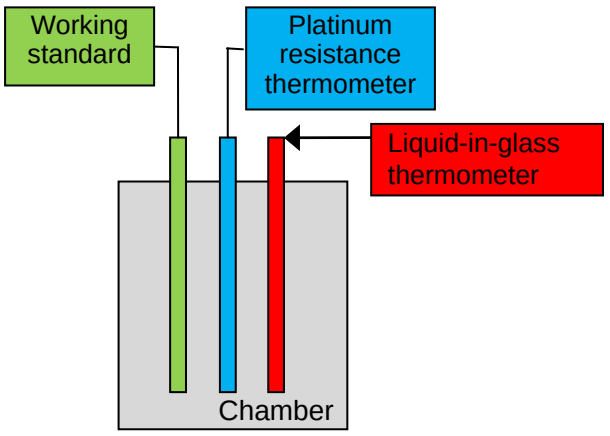
Platinum resistance thermometer : 1set

4. Work procedure

(1) Set a standard thermometer and thermometers to be calibrated in the chamber.

(2) Read temperature values of thermometers five times.

(4) Fill the values in "Thermometers comparison form" (on paper and PC(Exel sheet)).



5. Notes

(1) Insert the glass thermometer vertically into the chamber so deeply that the 30℃ unit line is fully buried.

(2) Insert the platinum resistance thermometer vertically into the chamber so that the depth of insert is more than 10 - 15 times of the diameter of thermometer to avoid thermal incursion along with the sheath.

(3) Enough warm-up time is necessary for platinum resistance thermometers according to its manufacturer’s specification.

(4) Read the values of thermometers of standard and to be calibrated at the same time. It is better using PC for data collection if possible.

(5) Temperature stability and distribution in chamber is important when you make highly accurate calibration.