

Organic chemistry lab



Question 2-What is the effect of an insoluble impurity, such as sodium sulfate, on the observed melting point of a compound? Insoluble impurities, although very undesirable, will not affect the melting point.

Question 3-Three test tubes, labeled A, B, and C, contain substances with approximately the same melting points. How could you prove the test tubes contain three different chemical compounds? Even if two different compounds have the same melting point, if they are mixed together the melting point of the mixture will be lowered because the compounds are no longer pure. You would take a sample from two of the compounds, X and Y, mix them. If the result of a lowered melting point is present, then the two are different compounds. Then take X and Z, mix them. If the result of a lowered melting point is present, then the two are different compounds. Do the same with Y and Z and mix them. If the result of a lowered melting point is present, then the two are different compounds. Thus all three compounds are different, if the melting point was proven to be lowered.

Question 4-One of the most common causes of inaccurate melting points is too rapid heating of the melting point bath. Under these circumstances, how will the observed melting point compare to the true melting point? If the heating block is heated too rapidly, the thermometer cannot keep up, and reads a value which is lower than the actual temperature of the heating block and of the compound.

Question 5-Strictly speaking, why is it incorrect to speak of a melting point? Experimentally, it is extremely difficult to establish the exact temperature at which this equilibrium is established; therefore, the temperature range over which liquid and solid are found to coexist is called the melting point. For

example, a solid may be reported to have a melting point of 100-101°C; this means that, on heating slowly, the first droplet of liquid was observed at 100°C and the last crystal of solid disappeared at 101°C.

Question 6-What effect would the incomplete drying of a sample (for example, the incomplete removal of a recrystallization solvent) have on the melting point? Incomplete drying will contaminate the crystal and depress the melting point.

Question 7-Why should the melting point sample be finely powdered? A fine powdered sample makes the heat transfer into the sample more efficient and reproducible, and also enhances the overall reflect ability of the sample for easier automated detection of the melt.