



Melting Point

Helper Booklet

## **8 Tips and Tricks** for Melting Point Determination

**METTLER TOLEDO**



## Dear Reader

First of all, thank you for your interest in this tips and tricks booklet for the chemical industry. We have summarized a set of tips and tricks about melting point determination. They will help you in achieving better melting point results, make melting point determination easier or refresh your knowledge about these topics.

Melting point determination is a proven method to characterize materials. The exact thermal values for a substance can be looked up in a number of comprehensive books and tables.

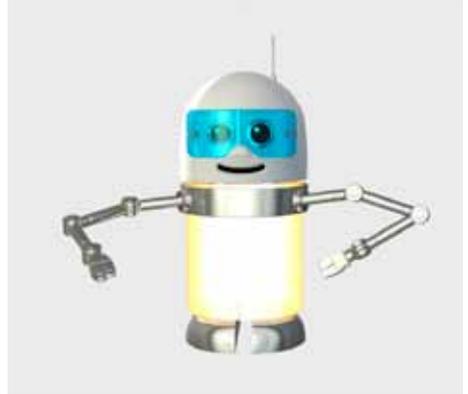
We hope you enjoy reading these tips as much as we did assembling them.

## Tip 1

## Heating Rate

### The Correct Heating Rate

Make sure the heating rate is at 1 degree Celsius per minute; most measuring errors come from too high heating rates. Time-saving tip: If testing an unknown sample with a high melting point, it is suggested to run a pre-test with higher heating rates, to get a rough idea of the melting point.

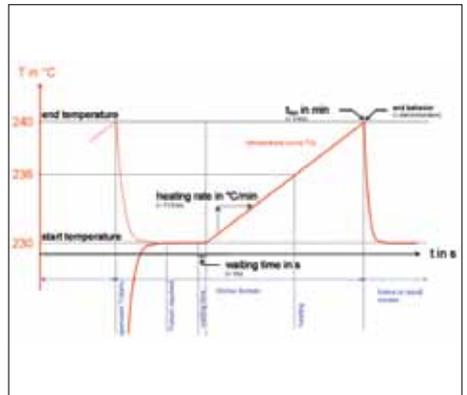


## Tip 2

## Starting Point

### Choose the Right Starting Point

Start the melting point determination of samples with known melting point 5 degrees below the expected value.



### Tip 3

### Effects of Impurities

#### Effects of Impurities on Melting Point

If the melting point result is lower than the literature value, it might be due to impurities. Especially with samples that melt below 50 degree Celsius, impurities seem to have a greater effect.

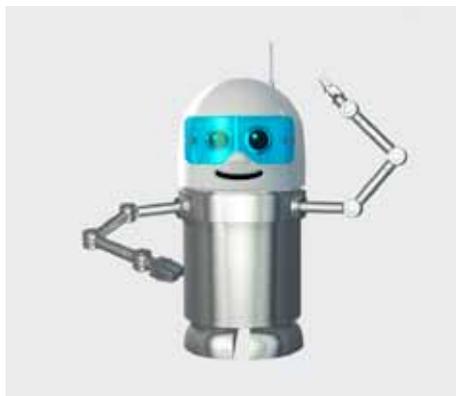


### Tip 4

### Use Fresh Samples

#### Prepare Fresh Samples

Use samples for melting point determination only once. For new experiments use fresh samples. Used samples can have impurities and changed attributes



## Tip 5

## Correct Grinding

### Grinding the Sample Correctly

Make sure to grind the sample to a very fine powder and pack it into the capillary without leaving air pockets. Too large pieces and loose packing will result in an inefficient heat transfer – and faulty results.



## Tip 6

## Sample Size

### The Ideal Sample Size

Do not overfill or underfill the capillary tube to avoid faulty results. The ideal filling height of the capillary tubes is normally specified by the producer of your instrument. Too large samples will result in a too wide or too high melting point range; too small samples might make it impossible to observe the melting point range. METTLER TOLEDO has developed a simple mechanism to always check if capillary tubes are filled properly.

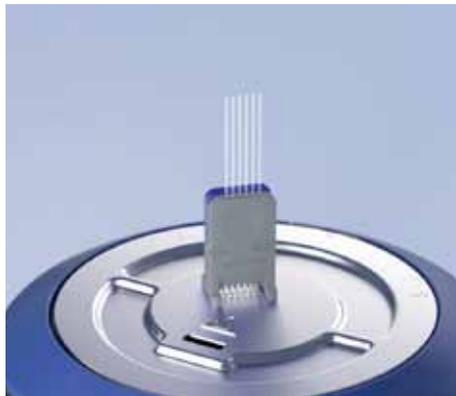


## Tip 7

## Sample Size

### Filling the Capillary Tube

If filling the capillary does not work, you can drop the capillary tube, open end up, down a glass tube with about 1 cm in diameter onto a hard surface. There is an easier option: METTLER TOLEDO instruments have included smart tools to bounce the capillaries very conveniently.



## Tip 8

## Mixed Melting Point

### Mixed Melting Points

To identify two samples with the same melting point you should use the mixed melting point method: Mix equal parts of the two substances and determine the melting point of the mixture. Run pure samples of both substances simultaneously. If the two substances are identical, the melting point for the mixture is the same as that of either sample. If the melting point is different from that of the two samples, the substances are not identical.





# Suggested Reading:

## Interactive Refinery Guide



The interactive refinery guide has been created for the petrochemical industry. A good reference source to get a quick and comprehensive overview.

► [www.mt.com/Refinery-Lab](http://www.mt.com/Refinery-Lab)

## Good Measuring Practices



Risk-based guidelines for weighing, titration and pipetting from METTLER TOLEDO empower you to make the right decision when it really matters.

► [www.mt.com/gp](http://www.mt.com/gp)

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