

Melting chocolate: fact sheet

Education in Chemistry

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Did you know chocolate begins to melt at a temperature lower than the temperature of the human body? That's why when you put some in your mouth it begins to melt.

So what is the melting point of chocolate? There isn't an exact point. There's a **range**, because it's a **mixture**.

What is chocolate made from?

Cocoa is the simple answer.

- Cocoa comes from the seed pods of cocoa trees.
- The seed pods contain beans, which are fermented, roasted and processed.
- Other ingredients, such as **sugar and milk**, are added to make the finished chocolate.
- The beans from the cocoa tree contain roughly 50% **cocoa butter**, which is **chocolate's main ingredient**.
- Cocoa butter is made up of **three fats** in roughly equal amounts. The **ratio of these fats** strongly affects chocolate's **melting range**.

Did you know ...?

Different types of chocolate melt over different **temperature ranges**, because they contain different amounts of ingredients.

Crystallisation

The **fats in cocoa butter** can form **six different types of crystal**, which melt at different temperatures:

Crystallisation type	Melting point	Taste notes
Type I	17.3°C	Soft, crumbly
Type II	23.3°C	Crumbly, melts easily
Type III	25.5°C	Firm but melts easily
Type IV	27.3°C	Firmer but melts easily
Type V	33.8°C	Best for eating: melts near body temperature, crisp snap
Type VI	36.3°C	Too hard

The melting range of chocolate depends on the types of crystals that chocolatiers create in the mixture.

Did you know ...?

Chocolate with Type VI crystals is sometimes used to make **heat-resistant** chocolate for army survival packs.

Tempering

To make chocolate melt in your mouth, chocolatiers try to maximise the amount of Type V crystals in their creations using a process called **tempering**. This involves:

- **Heating** the chocolate to about 40°C to make sure all the various crystal forms are melted.
- **Cooling** it gradually to 28°C to give a mixture of Type IV and Type V crystals.
- **Heating it again**. This time to 32°C to melt the Type IV crystals
- Then pouring it into moulds where it **sets**.

Melting ranges

The mixture of ingredients in chocolate recipes affect the melting point of the finished product. For example, adding milk to dark chocolate to make milk chocolate lowers the melting point.

Chocolate type	Percentage of cocoa solids	Melts at ...
Dark	85%	46–48°C
Milk	Between 20 and 50%	40–45°C
White	0%, roughly 20% cocoa butter	37–43°C

Did you know ...?

Dark chocolate contains theobromine, which is **toxic for dogs**. So don't give them any!