

Origin of temperature scales

Review text: page 62 - 62

Galileo Galilei invented a rudimentary water thermoscope in 1593, which for the first time allowed temperature variations to be measured. It was a container filled with bulbs of varying mass, each with a temperature marking, the buoyancy of water changes with temperature, some of the bulbs sink while others float, the lowest bulb indicated the temperature.

In 1612, the Italian inventor Santorio became the first inventor to put a numerical scale on his thermoscope. It was the first crude clinical thermometer and was designed to be placed in a patient's mouth for temperature taking.

Fahrenheit Scale

The first modern thermometer, the mercury thermometer with a standardized scale, was invented by Dutch inventor, Daniel Fahrenheit in 1714.

Temperature scales require points of reference.

In 1714 Daniel Fahrenheit built his scale on the work of Ole Rømer, whom he had met and discussed concepts of scales. With Rømer's scale, salt brine freezes at zero, water freezes and melts at 7.5 degrees, body temperature is 22.5, and water boils at 60 degrees. Fahrenheit multiplied each value by four in order to eliminate fractions. Hence, water freezes and melts at 32 degrees, body temperature is 90, and water boils at 240 degrees. Only 32° F (0° C) is accurate in a modern context

Fahrenheit chose the temperature of the body temperature of a healthy person (Fahrenheit's healthy person happened to be his wife) which he measured in the armpit at 96°. After Fahrenheit died, his successors used the boiling point of water to calibrate the thermometers. And they set it at 212° such that it retains the size of Fahrenheit's degree.

The zero point is determined by placing the thermometer in brine: he used a mixture of ice, water, and ammonium chloride, a salt, at a 1:1:1 ratio. This resulting temperature 0 °F (-17.78° C). The second point, at 32 degrees, was a mixture of ice and water at a 1:1 ratio. The third point, 96 degrees, was approximately the human body temperature, then called "blood-heat".

Scientists in the 1700s and 1800s researched what was the lowest temperature possible – see above. Lord Kelvin developed the idea of the coldest temperature theoretically possible, termed “absolute zero”. He presented the Kelvin Scale in 1848. The Kelvin scale uses the same units as the Celsius scale, but it starts at absolute zero, 0° K, the point or temperature at which atoms would stop moving.

Absolute zero equals - 273° C (degrees Celsius).