The Fast and the Freeziest

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The Mpemba effect is the occurrence of hot water freezing faster than cold. It is strangely counter-intuitive because hot water should take much more time to freeze than cold water because it should have much more thermal energy to lose than the cold water. Although it does not always occur, when it does, the Mpemba effect baffles scientists as to why. Scientists have been proposing explanations for decades, but none have been proven with high level of accuracy. The most popular theories include the higher evaporation rate of hot water, dissolved gases in water, convection currents, and the changing surroundings of the water, but none have been revealed as the sole cause. This project is an attempt to find an alternate cause that could have an effect. It is possible that the initial starting temperature and the amount of water will cause the Mpemba effect to occur. The experimental results show that, other causes aside, hot water rarely freezes faster than cold water. At the different starting temperatures and volumes, the hot water only averaged freezing faster than cold water 3 times. As the temperature got lower the volume had to increase much more each time. However this data definitely proves that volume and to a smaller degree, temperature, have an arbitrary effect on the Mpemba effect. These results could be used as reference points for future experiments by other scientists.

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