

Question: How does water salinity affect boiling time?

Rationale: I want to investigate this question because I've noticed that when people boil water they boil it in a pot normally, but they don't put anything in it either for flavor or to make it boil faster. I know salt makes ice melt faster so I want to investigate if salt also has the ability to make water boil faster. I think that if salt made a substantial difference in the reduction of boiling time of water, people might start to put salt in their water to boil or flavor it. This would help to make food faster, it would boil water and flavor food faster. This can be useful if somebody is in a rush to make food, especially a large portion.

Goals/Expected Outcomes/Hypotheses: I hypothesized that the amount of salt will not affect how fast the water boils. Salt will not make a perceptible difference in the time it takes to boil (a decrease in boiling time by at least 1 minute). My hypothesis is testable because I can easily acquire and change the amount of salt that I put into water. In order for water to boil, its vapor pressure has to equal the pressure of the atmosphere. This is why water boils at a lower temperature on top of Mount Everest than it does at sea level. When salt is added, it makes it harder for the water molecules to escape from the pot and enter the gas phase, which happens when water boils.

Description in detail of method or procedures: (During this whole experiment I will take lots of pictures for evidence). First, get out listed materials. Then, measure 2 quarts of water and pour it in the pot while making sure not to spill any. I will measure and pour 50 grams of table salt into the pot with water. I will stir the pot with minimal force for about 10 seconds. Then I will put the stove on high and start the stopwatch. When the water starts a slow rolling boil, I will end the stopwatch, turn the stove off and record the results. I will empty the contents of the pot, and put it on another burner for 5 minutes to cool. I will repeat this

experiment 4 more times, doubling the amount of salt each time, and at the end, I will make a control with no salt.

1. 1 Measuring Cup
2. 1, 8 Quart, Stainless Steel Pot
3. Paper and pencil
4. 1 Stopwatch
5. 1 Camera
6. 750g Salt
7. 12 Quarts of Room Temperature Water
8. 1 Tablespoon
9. 1 Spatchula

I will keep myself and others safe by watching the stove the whole time it is on

Procedure:

1. Prepare materials and remember to take pictures
2. Measure and pour 2qt room temperature water into pot
3. Measure and pour 50 grams of table salt into pot
4. Stir pot for 10 seconds with minimal force
5. Put stove on high and start stopwatch
6. When you see bubbles rising to the surface, stop timer and record results and observations
7. Empty the contents of the pot and set it on another burner for 5 minutes to cool
8. Repeat steps 2-7, four more times, doubling the amount of salt with every trial, use the same pot
9. At the end of 5 trials boil a control, using 2qt water and no salt

If the time the water takes to boil decreases as I add more salt, I will conclude that salt makes water boil faster.

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