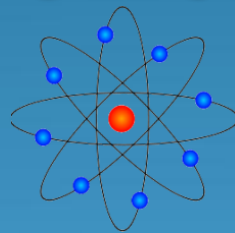




Russia
Voronezh



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"Pancakes"

- Some Housewives can bake pancakes that are so good looking that at the once glance to evoke a healthy appetite. Offer basis criteria for assessing the palatability of pancakes.



Objectives:

Part 1

- To bake pancakes.
- To investigate the view of pancakes in dependence of the concentration of salt and sugar.
- To justify the result and make a conclusion.

Part 2

- To consider the view of pancake and quantity of baking at different temperatures of the pan.
- To justify the result .

Equipment:

- The ingredients for the dough
- Pan
- The weights
- Multimeter

1 pancake



- 75 ml dough
- 10 ml sugar
- 2 ml salt

2 pancake



- 75 ml dough
- 20 ml sugar
- 2 ml salt

3 pancake



- 75 ml dough
- 30 ml sugar
- 2 ml salt

4 pancake

- 75 ml dough
- 30 ml sugar
- 4 ml salt



5 pancake



- 75 ml dough
- 30 ml sugar
- 6 ml salt

The conditions of the experiment

1. We make balance with 2 identical glasses on the scales



2. Pour some hot solution of salt or sugar into the right glass. We pour some cold water of the same mass in the left one.



3. We quickly measure the temperatures and hot solution of cold water



4. Measure the temperature of the mixture



The effect of salt on the color of the pancake (theoretical justification)

Опыт №	1	2	3
t_{1B} (the initial temperature of the water)	24	18	19
t_{1c} (the initial temperature of the salt water)	60	61	54
t_2 (the temperature of the mixture: water + salt water)	40	38	36
$C_{\text{смеси}}$	3360	3652	3966

- $Q_p = C_c \times m_c \times (t_2 - t_{1c})$

- $Q_B = C_B \times m_B \times (t_2 - t_{1B})$

- $Q_B + Q_C = 0, m_c = m_B$

(according to the experiment condition)

- $C_c = C_B \times (t_2 - t_{1B}) / (t_2 - t_{1c})$

Conclusion:

1) Salt reduces the heat capacity of the solution.

2) Pancakes fry faster and darken

The influence of sugar on the color of the pancake (theoretical justification)

Опыт №	1	2	3
t_{1B} (the initial temperature of the water)	22	23	22
t_{1c} (the initial temperature of the water with the sugar)	48	64	58
t_2 (the temperature of the mixture: water + water with sugar)	36	44	40
$C_{\text{смеси}}$	4536	4410	4200

Conclusion:

- 1) Sugar increases the heat capacity of the solution.
- 2) More time is required for preparation of the pancake with a ruddy crust.

The effect of temperature on cakes pancake

$t = 30^{\circ}$
(not baked)



$t = 45^{\circ}$
(baked)



The effect of temperature on cakes pancake

$t = 56^\circ$, appears yellowish color



$t = 66^\circ$, increases golden color



The effect of temperature on cakes pancake

$t = 95^{\circ}$, becomes hard, thick
cover

$t = 115-120^{\circ}$, The water
evaporates from the
surface of the dough and
the dough begins to burn.



Conclusions:

- The concentration of salt and sugar on the external quality of baked pancake affects
- Salt reduces the heat capacity in this result the pancake is fried quicker, and it may form a dark surface consequently.
- Sugar increases the heat capacity that makes the pancake more loose and increases the baking time
- The dough begins to bake at temperatures above 40°C ($42^{\circ}\text{-}45^{\circ}$). It is undercooked, if the temperature of the bottom of the pan is higher than 100°