

Lab 1B: Factors affecting reaction rate

Feb 3
Chem 12

Purpose: Investigating how temperature, concentration, and pressure affect the rate of reaction.

22.58	9.71	1.41M
23.81	9.01	0.01M

Procedure: Concentration 2.85

1. Measured 50mL of 1.0M & 3.0M HCl into two beakers.
2. Markedown the weight of the two beakers
3. picked two similar limestone tablets, Assigned them to a beaker, and then weighed them.
4. Calculated the starting weight for each beaker
5. placed both beakers on their respective scales. Add the limestone, and then took weight measurements on 30s intervals for 5 minutes.

Temperature & Surface Area

1. Measured 50mL of water into 3 beakers
2. heated up one beaker to at least 50°C with a bunsen burner
3. picked the 3 tablets and performed the same assignment procedure, calculating starting weight.
4. Picked a control beaker (not heated), and crushed the other room temperature beaker tablet.
5. Put the tablets in the beakers and took weight measurements on 30s intervals for 5 minutes, stopping once fully reacted.

start without endothermic reaction: $\text{HCl} + \text{CaCO}_3 \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$

	Test 1	Test 2
Concentration	1.0M	3.0M
m, HCl	17.9	32.5g
m, CaCO ₃	10.6	13.7g
m, total	28.5g	46.2g
m, beaker	49.1g	28.3g
mass	77.6g	71.5g
time	28.5g	46.0g
60s	28.3g	45.8g
1:30	28.2g	45.6g
2:00	28.1g	45.4g
2:30	28.0g	45.3g
3:00	28.0g	45.1g
3:30	27.9g	45.0g
4:00	27.9g	44.9g
4:30	27.9g	44.9g
5:00	27.8g	44.8g

- fizzing a lot

- fizzes a lot less

new crust around ~2:00

(between 2:00) turned brownish tan +

rotten egg smell

fizzing very much

turned black color.

solid

stinky smell

test #	test 1	test 2	test 3
crushed?	X	✓	X
heated?	X	X	✓
m, beaker, water	98.0 g	75.6 g	80.9,
m, tablet	2.6 g	2.5 g	2.5 g
0s	102.6 g 2.8 g	2.5 g	2.5 g
0:30	2.5 g	2.4 g	2.4 g
1:00	2.5 g	2.4 g	2.4 g
1:30	2.5 g	2.4 g	2.4 g
2:00	2.5 g	2.4 g	2.4 g
2:30	2.5 g	2.4 g	finished
3:00	2.5 g	2.3 g	-----
3:30	2.5 g	2.3 g	-----
4:00	2.5 g	finished	-----
4:30	2.5 g	FOV	-----
5:00	2.7 g	-----	-----

- green

- fizz @ 6g

- white bubbling foam

- foam slowed down ~2:30

- fizz faster

→ double rough

→ turquoise

→ saltwater

green foam

more solid form

yellow splotches

on foam