

The reaction inertness of alkane

Purpose:

At this experiment the reaction inertness of alkane will be shown with help of sulphuric acid. With the sugar we will compare the reactions of the paraffin and an organic substance.

Equipment:

solid paraffin
concentrated sulphuric acid
test tube

sugar (Sucrose)
potassium chlorate
test tube rack

Procedure:

At first four test tubes are put into the test tube rack and placed under the extractor hood. Then the solid paraffin is given into two of these test tubes. In the others the sugar is put into. Then potassium chlorate is mixed with the paraffin in one test tube and the sugar in one test tube. Then some few drops of the concentrated sulphuric acid have to be dropped into all test tubes. Be careful with the sulphuric acid because it's corrosive.

Observation + Data:

In the test tube with the paraffin and the sulphuric acid was no change.

In the second test tube paraffin, potassium chlorate and sulphuric acid discoloured yellow.

At the assay with sugar and sulphuric acid the sugar reacted strong and discoloured black.

And in the test tube with the sugar the potassium chlorate and the sulphuric acid was the strongest reaction and there was a small detonation and the sugar also changed the colour to black.



Conclusions:

The result is that at the first assay there was no reaction, but with the potassium chlorate it got yellow because of the sulphur in the acid. In the test tubes with sugar the sugar changed to carbon.

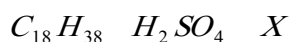
Assumption:

I think the paraffin hasn't reacted with the sulphuric acid because it's very stable. The yellow substance in the test tube with potassium chlorate was sulphur of the sulphuric acid.

I think the sugar reacted with the sulphuric acid to carbon because the sulphuric acid removed the water from the sugar. The potassium chlorate is an oxidant and so the reaction was stronger because the sugar was able to oxidise faster.

Interpretation/Explanation:

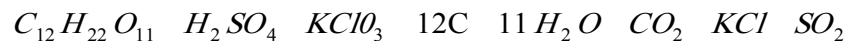
The paraffin doesn't react with the sulphuric acid because it's a C-C and H-C single bond. So the alkane is very stable and only reacts with strong oxidants. But at room temperature the alkanes are so inert that they react neither with concentrated acids nor strong oxidants.



The sugar is not as stable as the paraffin. So it reacts with the sulphuric acid at room temperature. At this reaction the sulphuric acid removes the water out of the sugar. So the substance in the test tube is Carbon.



The reaction of the sugar, the potassium chlorate and the sulphuric acid is stronger because of the oxidant potassium chlorate. The reduction of the potassium chlorate gives the O_3 to the sugar and the sulphuric acid. So the sucrose oxidises heavier with the sulphuric acid and the reaction is like a detonation. This reaction is used in some bombs.



Sources:

- 1) [Prof. Klemm 05.06.2007 14:55](#)
- 2) <http://de.wikipedia.org/wiki/Paraffin> 11.06.2007 15:24
- 3) <http://dict.leo.org/> 11.06.2007 15:38
- 4) <http://de.wikipedia.org/wiki/Kaliumchlorid> 11.06.2007 16:10
- 5) <http://www.wasser-wissen.de/abwasserlexikon/o/oxidationsmittel.htm>
11.06.2007 16:46
- 6) http://en.wikipedia.org/wiki/Potassium_Chlorate 11.06.2007 16:55
- 7) <http://de.wikipedia.org/wiki/Saccharose> 11.06.2007 17:03
- 8) <http://www.experimentalchemie.de/versuch-013.htm> 11.06.2007 17:19