

**Medical Instrumentation Systems
Lab Report - EEE 4202
Group 1
Laboratory Experiment 3
September 13, 2011**

NOTE: This is an illustrative example only for documentation purposes! This experiment is NOT to be performed.

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This experiment is NOT to be performed.

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This experiment is NOT to be performed.

Experiment I

Procedure:

A dangerous experiment using highly volatile materials is conducted to see what exothermal reaction takes place. This report is strictly for documentation illustration only and is not to be actually performed.

A small portion of the unknown liquid is measured into a safe container. The material is then exposed to high temperature flame. The experiment is designed to see what if any reaction takes place.

All precautions need to be followed to consider preventing negative results in case there is an explosive reaction. The best efforts are followed to prevent hazardous conditions even though results can be unpredictable in the immediate vicinity.

Steps

- I.1 Take a metal cup
- I.2 Place cup outdoors on concrete slab
- I.3 Add some gasoline to the cup
- I.4 Get a match
- I.5 Attach match to 10 foot long pole
- I.6 Light the match
- I.7 Hold the pole at full length away from you
- I.8 Touch the gasoline with the match
- I.9 Observe reaction
- I.10 Research temperature facts

Data Recorded



Illustration 1: Metal cup used in Step I.1

This experiment is NOT to be performed.



Illustration 2:
Fuel to be added
- Step I.3



Illustration 3: Cup on fire - Step I.8

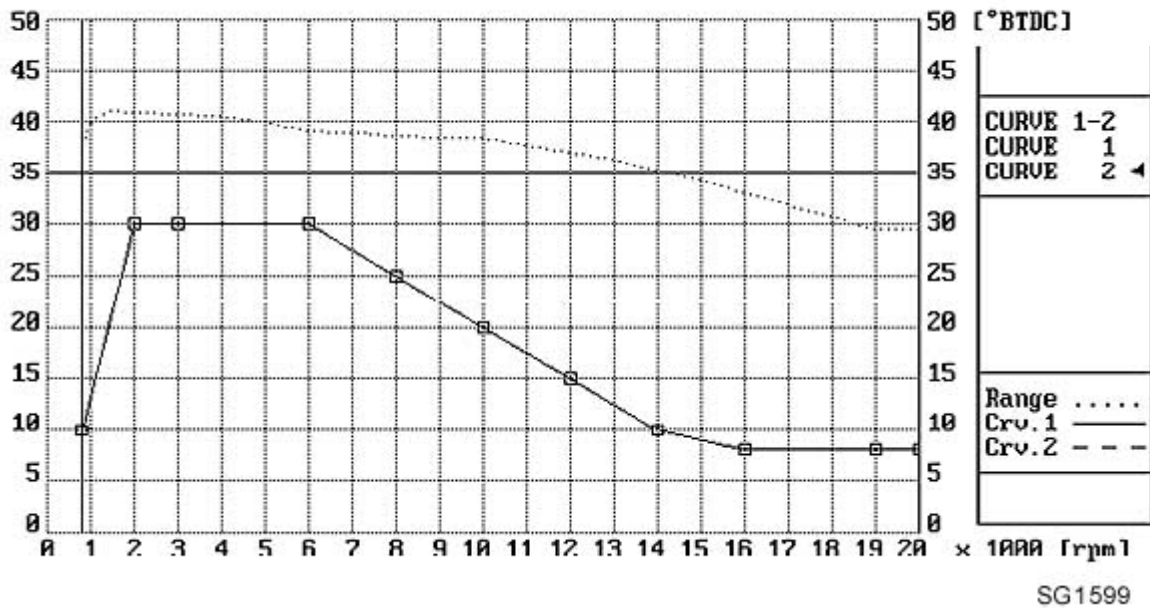


Illustration 4: Ignition data versus time - Observed results from Step I.9 and Illustration 3

This experiment is NOT to be performed.

Data Tables

Ignition Temperature of Gasoline

The Physics Factbook™
 Edited by Glenn Eiert -- Written by his students
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Bibliographic Entry	Result (w/surrounding text)	Standardized Result																
Glossary and Definitions Associated Information Technology, 21 May 2003.	"The most commonly known flammable liquid is gasoline. It has a flash point of about -50° F (-65° C). The ignition temperature is about 495° F (232(232° C) [sic], a comparatively low figure."	553 K																
Hazardous Locations , 2000. US Motor, 22 May 2003.	"Gasoline, also Class I, Group D, has an approximate ignition temperature of 280°C."	553 K																
Multimedia - Ignition Temperature Encarta Encyclopedia, 24 May 2003.	<table border="0"> <tr> <td></td> <td>Piloted Ignition Temperature</td> <td>Spontaneous Ignition Temperature</td> <td></td> </tr> <tr> <td></td> <td>°C</td> <td>°F</td> <td>°C</td> </tr> <tr> <td>Gasoline</td> <td>-43</td> <td>-45</td> <td>280</td> </tr> <tr> <td></td> <td></td> <td></td> <td>536</td> </tr> </table>		Piloted Ignition Temperature	Spontaneous Ignition Temperature			°C	°F	°C	Gasoline	-43	-45	280				536	530 K
	Piloted Ignition Temperature	Spontaneous Ignition Temperature																
	°C	°F	°C															
Gasoline	-43	-45	280															
			536															
Properties of Fuels (pdf), 25 May 2003.	Gasoline Autoignition Temperature, °F 495	530 K																
Ignition Temperature , Taftan Data, 1998.	"Each fuel should be brought above its Ignition Temperature for starting the combustion process. An appropriate air-fuel ratio is also necessary. The minimum ignition temperature at atmospheric pressure for some substances are: carbon 400 C, gasoline 260 C, hydrogen 580 C, carbon monoxide 610 C, methane 630 C."	533 K																

Illustration 5: Ignition Temperature of Gasoline: Research Data- Step I.10

The data in Illustration 5 reflect the ignition temperature of Gasoline and other fuels obtained from <http://www.energeticforum.com/renewable-energy/3288-efficient-carburetor-designs-4.html>

Observations	Time	Value
Before reaction	1	10
Immediate reaction	2	30
Full intensity	3	30
Still intense	6	30
Starting to decrease	8	25
Definitely decreasing	10	20
Beginning to wind down	12	15
Almost done	14	10
Finished	16	8
Still quiet	19	8

Illustration 6: Actual observed results used to build Illustration 4 from experiment Step I.10. These data were measured during the burning phase of the observations

This experiment is NOT to be performed.

Observations

1. Following careful preparation in the steps I.1 through I.6, the experiment procedure was followed.
2. Once Step I.8 was followed, there was a large spontaneous reaction - Illustration 3. The measured temperature and time results are shown itemized in Illustration 4 and Illustration 6.
3. Large amounts of air (oxygen) were consumed. Lots of flames, heat, and smoke were produced.
4. Step I.9 requires observing the results. It can be seen from Illustration 3 that the reaction was very spontaneous and produced a lot of heat and energy.
5. Temperatures were recorded and they have been plotted in Illustration 4. These data are recorded in manually in a table in Illustration 6.
6. Illustration 5 is a table of data that are related to the characteristics of the reactions.

Lessons Learned (Conclusions)

As can be seen from Observations 2 & 3, igniting gasoline produces a large exothermal reaction - Illustration 3

The intensity of the reaction lasted quite a long time - see the table in Illustration 6

As is seen in Observation 3, this could be a VERY DANGEROUS experiment. The procedure should not be done except under extremely controlled safe circumstances

The results in Observation 4 show that anticipation should be used in case of danger.

Appendix:

Add copies of hand written notes of steps and results obtained while performing the procedure

This experiment is NOT to be performed.