

8/22/21

Alright, I'm back to working on my science fair again this year. This year, I must have a partner for this year's project, so I am pairing up with a classmate. His previous projects had been more geared towards engineering. While my previous projects were more towards alternate invention innovation and new discoveries. This will be part of reason why my partner will work so well together. Also, our projects that we worked on last year will mesh together well. I did hydrogen production, while he worked on airship design. Both of these backgrounds will definitely be helpful in the upcoming project.

9/1/21

A discussion occurred between my partner and me about Erance Fair. I did not really know that ~~about~~ his previous projects, and project is a continuation of his I learned about his airship design. His first year, he was figuring out what material to use for the airship. His second year, he worked on the structural design of the airship being in on the design of the wings to produce the most lift and stability. I am aiming to have a full working airship by the end of the year, but going for general that part would not really be sound science. We have to be methodical and find one specific aspect of the airship to test and improve. I am thinking that we should do something related with the gas the airship uses to float since I have some experience with hydrogen gas and its production.

Topic Ideas

9/6/20

Since this is a continuation from a previous project we are going to do something related to the improvement of airships.

Topic #1: Address the safety issue with using hydrogen gas to provide the airship with lift.

~~Hydrogen gas is~~
Hydrogen gas is highly explosive when ~~it~~ ^{is} ~~lit~~ ⁱⁿ or ~~fire~~ ⁱⁿ fire.

Experiment a) ^{at cabin} Dissociate ^{at cabin} gases to find out what ratios of what gases will provide ~~not~~ ^{at cabin} lift and least explosivity.

Experiment b) Make it so that materials of the airship would allow for any explosion.

Experiment c) Test if hydrogen gas is the best when compared to other light gases.

Topic # 2: See if propellers should
should really be powered
by batteries or something else.

Batteries can have considerable weight and they are limited in energy, however power generated on-site would direction not be a limiting factor anymore.

Experiment a) ~~see~~ design a sort of hydro generator.

Experiment b) use fuel cells

Experiment c) see how effective solar and wind are and how they would be implemented.

9/11/21

The topic I am interested in researching for my science fair project is finding what is the best gas to use for the newly designed airship. It is interesting to me because I have always been looking into and fascinated by renewable resources. I have been working with and studying fuel. Lastly, I have been working with and studying hydrogen gas. I think I can perform experiments to see what happens to the weight and safety of the airship when I change what gas is inside the airship, but I need to do more research about this. I may have to purchase some steel plates ^{if not, we can just use balloons} or maybe some sort of voltage output meter. We will need to buy the helium from the store for sure. I checked how much the materials may cost and where to get them. We will obtain the helium by purchasing helium-filled balloons from the dollar store. Maybe I will need about 20 of them so that is \$20. I can get a 12 x 24 steel sheet at Home Depot for \$8.18, for example. I think my experiments will take a couple days long. I talked to my parents and they approved my topic and to purchase the materials I need. If I need more, I can pay it out of my own pocket.

I did a lot of research today, learned
more about zeppelins and their history. I also
spent time learning about how hydrolysis works
and some homemade designs.

7/25/21

Turned in the first draft of the paper
today, but I realized that we need to store
the freshly generated hydrogen gas

10/8/21

11/2/21

Independent variable - the lifting gas is changed

Method of measuring independent variable - how much gas is used, by using a rubber foot balloon.

Dependent variable - how much weight each gas can carry

Method of studying measuring dependent variable - add one gram at a time until the balloon falls.

Control variables - amt of gas in the balloon, method of putting the weight on the balloon, flying conditions

How to control - use balloons that don't stretch, fill a separate one at a time. Do the test indoors or outside the school building.

Hypothesis - the hydrogen gas with the highest purity would be the most ideal gas.

If the lifting gas is changed ^{by using different gases} by the most airship, then the purest form of hydrogen gas will be the most ideal and lightest gas if the amount of gas and testing conditions are kept the same.

11/2/21
Independent Variable - the lifting gas is changed

Method of measuring independent variable - use the balance with each different gas

Dependent Variable - which gas has the highest purity

Method of measuring dependent variable - use the hydrogen purity analyzer

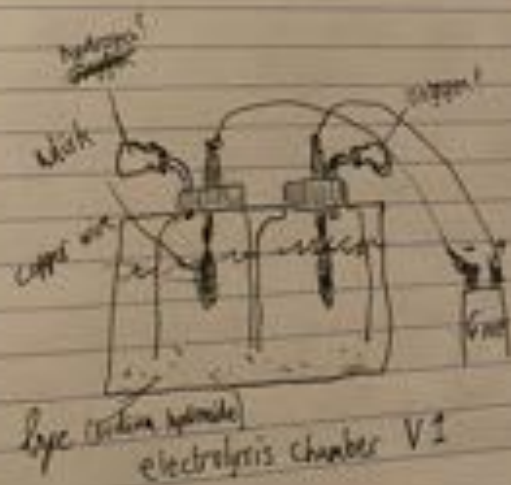
Control variables - see constant do not mix into the purity analyzer or I know it is with other ones.

Hypothesis - The hydrogen gas with the highest purity will lift the most weight and be the most ideal gas.

If the purity and the lifting gas is changed using the different methods of producing hydrogen gas, then the most purest form of hydrogen will be the most ideal gas to use, as long as the purity is measured correctly

My partner and I got together and gathered materials for the experiment. We designed a hydroponic chamber and found and made all the parts for it. We cut out all the pieces and put them together. We also went to the store to ~~buy~~ order containers.

11/1/2011
We went into class today with the hydrogen
chamber. We straped wires and connected a
6 Volt battery to the chamber. We think the negative
side makes the hydrogen and positive positive side
makes the oxygen. First we don't know for sure
because it did not generate enough gas and test
it out.



Test Day

1/26/01

First of all, exchanged the copper wire for the steel wire in the hydrolysis chamber to make it more efficient. Also we tried using a car battery recharger as a power source, we couldn't get it to hold a charge, so it didn't really work well. In the end, we used a 12 volt motorcycle battery which worked the best. Unfortunately, the hydrolysis is still incredibly slow, but we started it first in the beginning of the day.

We then set up the system for testing weight capability. We filled a 2.31667 cubic centimeter mylar balloon with helium gas and placed it in the cage of the mouse. The balloon kept rolling, so we forced it in using a screw and a 14 gauge wire. The wire was 10 cm

We put ^{the wire} against the wall where the top of the tape indicates the bottom of the gas cell and the top of the mouse. We used a level to make it straight and better control the experiment.

Ok - function Weight Capacity (mg) Test Run Test 1

Ok - moved at 5g

Ok - lifted up and down at 14g

Ok - dropped at 21g

Tested 5 times - same results

Result - could hold 20 additional grams

11/26/01

We attempted to generate hydrogen gas using the Alumin. Chlor. - NaOH (water) method. We filled a 2 L flask with water and added ca. 6 Tablespoons of lye (sodium hydroxide). All the turned a pinkish hue. We prepared 10 gms of aluminum foil and dropped into the container. The setup floated so we used a string not to submerge the aluminum to the solvent and quickly screw on the cap. The cap has a hole and tube in the center of the lid and the unfilled nylon balloon attached to the other end of the tube. The reaction was pretty quick and the balloon filled up quite a bit. Unfortunately, the liquid started spurting up through the tube where the pressure pushed the now liquid liquid into the balloon. This test failed because the weight of the balloon would be not over due to new liquid.

For attempt 2, we did the same thing but made sure the liquid level was not spilling down to the side. This, however, also failed because the liquid was sent into the balloon. It was in fact that the rate of hydrogen production is so excessive reaction to the heat that the water into vapor and the pressure builds up so eventually it goes to the only opening the balloon valve, in both gas and liquid form. That is not hydrogen, and we want it pure. We have to find a way to live this problem.

3/26/01

For attempt 2 for aluminum, and it grows hydrogen gas we designed a way to fix the water seepage problem. We figured the best way to stop the water from going into the bottom is if we cool it down first. We extended the output pipe and made it flow into a second container filled about 2/3 full with ice water. This way the water we will flow into the bottom of the test vessel as a liquid form of will stay with ice water liquid and the vapor will condense into liquid and hopefully not condense the hydrogen gas.

It worked! But we did have to refill the ice some of the time.

When the balloon filled up with hydrogen we tested how much weight it could carry by using the same method as testing the helium.

1 report clip - 2 pins.

WT. Test for Aluminum

designed at 25 psi

Test 1	24 g
" 2	24 g
" 3	24 g
" 4	24 g
" 5	24 g

Made the hydrogen using the same method as the of the aluminum use zinc and sodium hydroxide (lye). Used the corking charcoal.

1/2/2003

It worked.

When the styrene balloon was filled up with the gas we tested how much weight it could carry by using the same method as testing the helium.

2 papers = 2 grams

Test #	WG	Test for gas
1	22g	dropped at 23 grams
2	22g	
3	22g	
4	22g	
5	22g	

WG	Tier list (last top & bottom)	Best
24g	Hydrogen - Aluminum	Best
22g	Hydrogen - Zinc	middle
20g	Helium	Lowest

21 August 2018

This will be my science fair journal for this year (2018/21).
The plan for this year is to continue on the same path as last
year so I will be working on the airship that I have been
having my science fair off of for the last two years.

This project might be a two person project.
I will most likely be partnering with a student who did a project on
hydrogen generation.
This works out for both because I will need hydrogen this year
and he is looking to continue his project from last year somehow.

5 October 2011

I have still already chosen to stick with my dining project, and now that I have a partner who worked on hydrogen generation last year, I want to focus on hydrogen.

Possible Projects

1. Focusing on the safety of hydrogen.
This would go against Trump's complaints about the danger of hydrogen.

This one is problematic because I don't know what to measure.

2. Finding the purest form of hydrogen.
Hydrogen is less reactive than when it's mixed with oxygen.

This could be done without experiment in the research phase.

3. Comparing lifting capabilities of hydrogen to helium.
Prove that hydrogen is more practical even though it's more dangerous.

This could be measured in grams.

17 September 2022

The topic I am interested in researching for my science fair project is airships. It is interesting to me because it's something I have been working for the last few years. I think I could perform experiments to see what happens to weight carrying capability of an airship when I change the lifting gas, but I need to do more research about this. I may have to purchase a major item. I checked how much it will cost. It will cost about \$100 and I can purchase them from Amazon. I think my experiment will take about a weekend.

my parents will allow this

Fachler

our independent variable is the kind of lifting gas we put in the balloon.

We will test which can lift more by adding 1 gram increments.

We will test the purity with a hydrogen purity analyzer or through a stand test.

The dependant variable will be how much weight the lifting gas can carry.

The size of the balloon will be controlled as well as the method of adding weight, the increments of weight.

We will weigh the hanger for the weight before hand.

14 October 2011

Today we talked about what and how to measure
the weight capability.

We are planning on doing a hook and adding
paper clips.

This works cause we know each paper clip is
one gram.

Still wondering how we are going to be
able to test the parity.

13 October 2011

Today my partner came over to assess the materials we think that we are going to need to test this.

once we get the materials we are going to do a smaller test to see if we can actually produce the hydrogen.

20 October 2011

We collected many of the materials we need.

We are still missing the mylar balloons we will be using for the actual test.

I got some regular latex balloons to serve as place holders for today's tests.

Today we just used the chemicals in plastic bottles ~~and~~ and put the balloons directly on top of them.

The balloons filled up very quickly a really good sign.

We did not have the materials to put together the electrostatic generator today.

Today we put together the electrical generator.



We will bring it to the school to test it soon.

Test Day

28 November 2021

We started by setting up all the materials on the table

We also set up three small balloons for each production method

We set up the Hydrolysis generator first but it did not end up working.

Too slow to be practical even with the larger tubes.

We started by filling the first balloon with nitrogen from the tank

We then set up the hot spot

We put a hook on the back of the balloon and hung paper clips on it until it sank down.

We then set up the aluminum method using aluminum foil.

This one failed and erupted like a volcano the first few times because of the heated reactor.

After this we added an ice chamber and were able to fill a balloon with the hydrogen produced.

We put the balloon in the testing spot and added paperclips until it sank.

We then set up the zinc method with a electrolytic cell same setup as aluminum except it also has Zn from stripped pennies.

8/10/2018

we tested the electrolysis generator today

so far it is not effective

It is way to slow to get be beneficial

but it does produce hydrogen bubbles

we need to get a bigger battery to ramp
up speed.

Once we got a whole balloon full we put it in
the testing area and added paper clips until
it descended.

We did this for all three gases 5X