2022 Tri2 Final Practicum

Name _____

Per. ___

Day 1: Directions: Friday 3/11/22 Mass out $KClO_3$ (Potassium Chlorate)

1. Mass your evaporating dish (looks like a cereal bowl).   Add it to your Data Table (#1)
2. Get a sample of potassium chlorate ($KClO_3$) from Donde at the balances (approx. 0.75-1.10 g). Record the **actual mass** in data table #2)
3. Find the mass of $KClO_3$ - show work in the data table - put your answer in #3.
4. Store the potassium chlorate in your chemistry locker covered with paraffin wax paper. **(secure dish in drawer so it doesn't spill)**. Give your Data Sheet back to Donde

Day 2: Directions: Monday 3/14/22 Equation & Calculations

1. Write the balanced equation.
2. Calculate the amount of sugar needed to react **completely** with your potassium chlorate ($KClO_3$) **Show all work. Make your work *complete - units conversion factors sig. figs***.
3. Also calculate the amount of potassium chloride that you will be producing **(in grams)**.
4. Work through all calculations. *All the lines* under $KClO_3$, $C_{12}H_{22}O_{11}$, and KCl should be filled out. Make calculations clean & complete!!! **SHOW ALL CONVERSION FACTORS WITH UNITS!!!!! (Cl is chlorine)**

Day 3: Directions: Tuesday 3/15/21 - Goggle Day for ignition

1. Find the mass of a "weighing boat".
2. Measure out the mass of sugar you **calculated** (as close as possible) needed onto a plastic "weighing boat".
3. Mix the sugar and potassium chlorate together in an evaporating dish. Stir thoroughly, trying to push out any lumps or chunks. The better it is mixed, the better (more completely & quickly) it will react.
4. Once you are ready for ignition, place your evaporating dish on the lab table **labeled with your lab station #**. Students will ignite their fireworks one at a time. ***Wait for everyone to be completed.*** All the dishes will be lined up - the fume exhaust will be on, lights off. The moment of truth! Did you calculate the sugar amount correctly? We will all see.
5. **IGNITION**: **GOGGLES ON - SLEEVES ROLLED UP!** One lab station at a time will light their reaction. Take a new wooden splint and light it in a candle. Stand back with arm extended and light your firework!
6. Once the reaction cools, take a final mass of your burned product (KCl).
7. Use your calculations from Day 2 to calculate your percent yield of (KCl) you produced. What happened to the mass of carbon dioxide and water?
8. Clean up your mess - scrap product into the trash - wash out your evaporating dish. Return the dish and glass stir rod to your drawer. Put your goggles in the plastic bag (with your name on it) in the box provided. The goggles will wait for your return in the 3rd trimester.

CHEMISTRY-A FINAL LAB PRACTICUM (Tri1)
DATA TABLE

Name _____**Per.**_____   **Day 1 & 3 Data Sheet (turn in both)**

List all lab partners: _____ **Lab #**_____

Data Sheet: * indicates calculations **must** be shown—at left please

DAY 1 (copy data from Day 1)

1. Mass of Evaporating dish   _____ (3/11/22)

2. Mass of Evaporating dish and $KClO_3$ _____(3/11/22)

3. *Mass of $KClO_3$ _____(3/11/22)

DAY 3

4. Calculated Mass of sugar (Day 2)   _____(3/14)

5. Mass of plastic "weigh boat"   _____

6. Mass of boat and sugar   _____

7. *Actual Mass of sugar   _____

8.   Mass of evaporating dish & burned mess   _____

9. *Mass of burned mess (Actual mass KCl)   _____

10. Mass of KCl Calculated (Day 2)   _____

11. *Percent yield KCl   _____

%Yield =   <u>Actual (grams)from lab</u>   x   100%

          Calculated grams (from day 2)

Why is #9 higher or lower than 100%? Suggest a clear hypothesis:

Where did the water (H_2O) and carbon dioxide (CO_2) go?

DAY 2: Equation & Calculations   Name _____
Stoichiometry of Fireworks!

Fireworks companies design their products to be mesmerizing and entertaining. They also design their products to be efficient, as some of the chemicals used can be quite costly. Your job is to determine the exact amount of reactants to use in the production of a firework display. The company is requesting the fireworks be made in various sizes, so the amount of chemical needed for each size will vary (vary between lab groups). Using stoichiometry, you will calculate the ratio of reactants needed for the optimum explosion.

The reaction used to produce this firework is as follows: potassium chlorate ($KClO_3$) and sugar ($C_{12}H_{22}O_{11}$) react when heated to produce carbon dioxide (CO_2), water (H_2O) and potassium chloride (KCl). Write the **balanced** equation.

| (potassium chloride) | | (sugar) | | (carbon dioxide) | | (water) | | (potassium chloride) |

___$KClO_3$___ + _____ --------> _____ + _____ + _____

mol_____   _____   _____   _____   _____

gram_____   _____   _____   _____   _____

(Data #3)

1. Show your calculations for the amount of sugar needed (grams) for the optimal reaction. Fill in the mol/gram lines above as you calculate them. You can do this in one step or break it down - Show me all units and conversion factors - watch sig figs! **Box your answer!**

2. At the end of this reaction, there will be a black substance. We are assuming this is KCl. Calculate the mass in grams of KCl we should have at the end of this reaction. This number will be used tomorrow to find percent yield. **Box your answer!**

2022 Tri2 Final Practicum

Name _____

Per. __

Day 1: Directions: Friday 3/11/22 Mass out KClO$_3$

1. Mass your evaporating dish (looks like a cereal bowl).   Add it to your Data Table (#1)
2. Get a sample of potassium chlorate (KClO$_3$) from Donde at the balances (approx. 0.75 -1.10 g). Record the **actual mass** in data table #2)
3. Find the mass of KClO$_3$ - show work in the data table - put your answer in #3.
4. Store the potassium chlorate in your chemistry locker in the evaporating dish, covered in paraffin wax **(secure in drawer so it doesn't spill)**.

CHEMISTRY-A FINAL LAB PRACTICUM(T1)
DATA TABLE - 3/11/22

Name _____Per._____   Day 1 & 3 Data Sheet (turn in both)

LIst all Lab partners: _____ Lab #_____

Data Sheet: * indicates calculations **must** be shown—at left please

DAY 1

1.   Mass of Evaporating dish   _____ (3/11/22)

2.   Mass of Evaporating dish and KClO$_3$ _____(3/11/22)

3.   *Mass of KClO$_3$ _____(3/11/22)

Turn this in after you get to #3 - hand it to Donde

Two numbers after the decimal for all masses - even calculated mass

Note to Chemistry Teachers:

I need to find a better, more efficient way to do this final.

I make it a three day Final.

1. Mass out the $KClO_3$ (20 minutes)
2. Stoichiometry calculations. You know how much $KClO_3$ you have - how much sugar will you need, and how much KCl will you produce (all period for some - I make my stronger stoich students help the kids that are struggling.)
3. Measure out the proper amount of sugar, mix and light the firework - we line them up and light when they are all lined up. Fun - then clean up and locker check out.

Also - a side note and this little fact was super important to me. We did this final - the last day of school before Covid shut down school in person. We ended with a bang, and I was sure we made some chemists that day. This little lab helped me keep the faith that we could get back to school - those were (still are) scary days.

If you find a way to trim this lab down - or make it more efficient, I would love to see your write up. I have to hand out numbers from day one to day two. Then from day to day three.

It can be done in two days - but I like one whole day just for calculations. This final is a bit different. I watch all the kids calculate, but I answer questions and end up guiding some kids step by step. Today I put up one number in the balanced equation - to help. Let 10 minutes go by, then another number. I have my superstar kids guide the strugglers (after they are done with their own tests) - because, what is most important? Learning. I see learning going on.   (My real final is the 5 part copper lab - and I grade that very detailed - this final almost all the kids get 100% - and my grades will be done on Monday).

Thank you,
Kathy Donde