

Materials: 1 M $\text{NiSO}_{4(\text{aq})}$, 1 M $\text{NaOH}_{(\text{aq})}$, 1 M $\text{Fe}(\text{NO}_3)_{2(\text{aq})}$, spot plate, balance, plastic dropper

Procedure and observations:

1. 3 drops of $\text{NaOH}_{(\text{aq})}$ were placed in a cavity on the spot plate.
2. Then 3 drops of $\text{NiSO}_{4(\text{aq})}$ were placed in another cavity on the spot plate.
3. A plastic dropper was placed on the spot plate, and the whole thing was transferred onto a balance.
4. The mass was recorded in a data table.
5. The dropper was picked up to add the $\text{NiSO}_{4(\text{aq})}$ to the $\text{NaOH}_{(\text{aq})}$, and then the dropper was left on the balance.
6. A greenish solid formed in the mixture. There was no difference in mass recorded.

Questions:

ST Part

1. Why did the mass remain the same from the point of view of atoms?

The number of atoms are conserved. They do not get destroyed; they just form different compounds.

2. Was this a chemical reaction? Evidence?

Yes. There was a color change (green substance) and the formation of a precipitate.

3. Why would someone come to the wrong conclusion if they waited too long to reweigh the products of the reaction?

Water from the solution could evaporate. The precipitate could react with the air.

4. a) If the electronic balance reads 2.04 g, which decimal place is an estimate, if any?

The 4 (last decimal) is an estimate.

b) What does 2.04 ± 0.01 g signify?

The actual value can be anywhere from 2.03 to 2.05.

5. Without certain materials, the splitting up of water with electricity is a very slow process. What can be used to speed up electrolysis?_____

The addition of acid or salt.

6. Why is a pipette more accurate than a graduated cylinder of the same size?_____
- _____

There is a narrower section where the volume is read. If too much or too little is added the difference in height will be more obvious.

STE

1. In the 1st part of the lab, $\text{NaOH}_{(aq)} + \text{NiSO}_{4(aq)}$ reacted to produce two compounds. Based on the knowledge that all sodium compounds are water-soluble, write an equation that reveals the two products, including the precipitate.



- 2.
- a) In making ethyl benzoate we used two types of compounds that can be used to make all sorts of interesting esters. What were those compounds?

Organic acids and alcohols

b) After reacting $\text{NaHCO}_3 + \text{HCl} \rightarrow \text{H}_2\text{O} + \text{CO}_2 + \text{NaCl}$,
litmus revealed that the compound HCl was evaporating.

3. Of the following, which do you believe will affect whether or not you see a precipitate after mixing two ionic substances, as you did in the lab today?
There may be more than one answer.

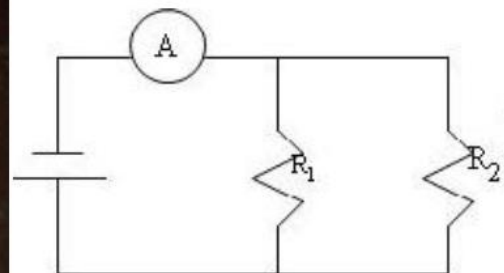
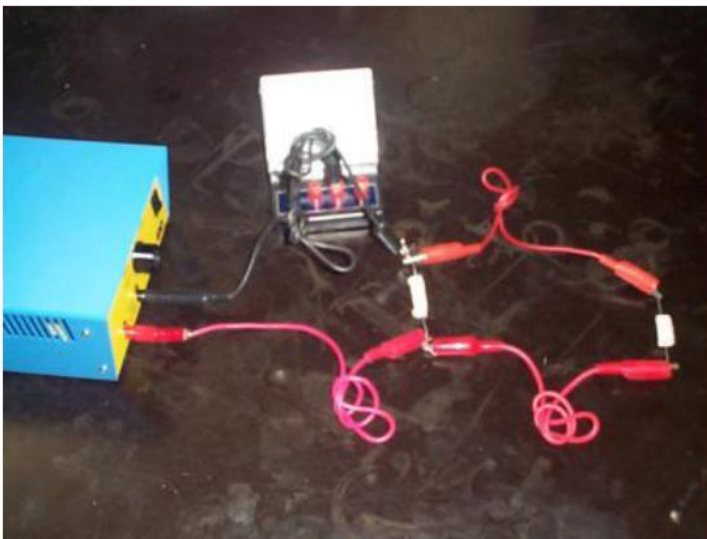
___ the type of ions that could potentially bond to each other

___ the concentration of the reactants

___ the pH

All three.

4. a) Show how you would attach a voltmeter and an ammeter in a parallel circuit so that you can measure the voltage and current across one specific resistor.



The voltmeter should be attached directly to the power source, with one wire on the (+) end of the power source and the other wire on the (-) end of the power source.

b) If you compare the same parallel circuit to the one with the voltmeter and ammeter, how many extra wires do you need to attach the two meters?

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