

Indicators Lab

There are three sets of activities and a set of questions you must complete during this lab. You may do the activities in any order.

~~are also welcome to take the trays back to your table to work or stay at the station.~~

Station #1-pH Paper Identification

1. Pick one of the clear solutions and pour about 50 mL into a beaker.
2. Take one piece of pH paper from the tray and touch the end of it to the surface of the liquid in the beaker.
3. Match the color of the paper to the scale on the side of the container.
4. Repeat steps 1-3 for the other two clear liquids.
5. Place an antacid tablet in the beaker that contains the acid and observe what happens.
6. Test the pH of the acid after the antacid has been added.
7. Throw the pH paper away. Pour the liquids into the sink. Clean out the beakers and wipe them dry. Wipe down the sink counter.

What was the pH of solution A? 5

Is solution A an acid, base, or neutral? base/neutral

What was the pH of solution B? 7

Is solution B an acid, base, or neutral? base

What was the pH of solution C? 3

Is solution C an acid, base, or neutral? Acid

How did the pH change when the antacid tablet was added to the acid?
It changed to red (acid)

What is in your stomach an acid, base, or neutral? Acid.

What do you use antacid tablets for? to neutralize acid

Is an antacid tablet an acid, base, or neutral? base

What will an antacid do to your stomach? neutralize the acid

Station #2-Raddishes

1. Take the radish and index card from the tray. Rub the radish onto the index card so that the card becomes red (you only need to make part of the card red, not the entire card).
2. Take the Q-Tip from the Dixie cup containing orange juice and dab it onto one spot on the index card. Note the color on that spot of the index card.
3. Repeat step 2 for each of the remaining solutions.
4. Throw away the index card. Wipe down the counter or table top. ~~Put Miss Slater~~ if anything is empty or needs to be changed.

What color should have appeared for the acids? Red

What color should have appeared for the bases? Blue

List the solutions as either acids or bases.

Acids	Bases
Orange juice Coke	Mouthwash

What are most of the acids used for? dissolving / drinking

What kind of taste do acids have? Sour

What are most of the bases used for? cleaning

What kind of taste do bases have? bitter

What do you have in your stomach (acid, base, or neutral)? acid

Would it be better to add acids or bases to your stomach? bases

Station #3-Cabbage

1. Place half a leaf of cabbage into a plastic baggie.
2. Add two plastic cups full of water.
3. Close the baggie (make sure most of the air is out of the baggie).
4. Use your hands to mix the cabbage and water together for about a minute.
5. Pour the solution into two Dixie cups (you want an equal amount in each cup).
6. Add one teaspoon of glass cleaner to one cup.
7. Add one teaspoon of lemon juice to the other cup.
8. Pour the liquids into the bucket. Throw the cups, cabbage and baggie away. Wipe off the desk top.

Which solution was your acid? the lemon juice

What color did the acid turn in the cabbage solution? Pink/Purple

What is this acid used for? Dissolving food/cleaners

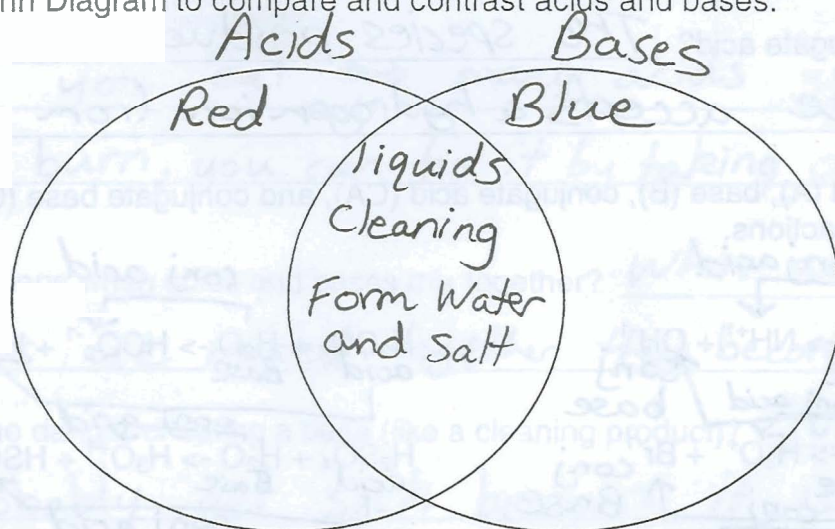
Which solution was your base? the Glass Cleaner

What color did the base turn in the cabbage solution? Blue/Green

What is this base used for? cleaning

Questions

4. Use the Venn Diagram to compare and contrast acids and bases.



1. What is the name of the type of chemical that tells if you have an acid or a base solution?

Indicator

2. What is the color for acids? Red

3. What is the color for bases? Blue

4. What is pH? power of hydrogen (Acids)

5. What is pOH? power of hydrogen (Bases)

6. List the two models of acids and bases from your notes. Arrhenius Model - Acids and Bases / Brønsted-Lowery Model - Acids and Bases

7. According to Arrhenius, label each as an acid (A) or a base (B).

H₂S A

CH₄ B

NaOH B

HCl A

KOH B

HNO₃ A

NH₃ B

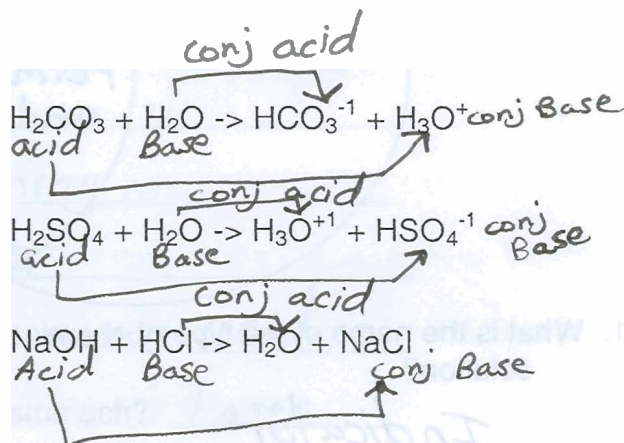
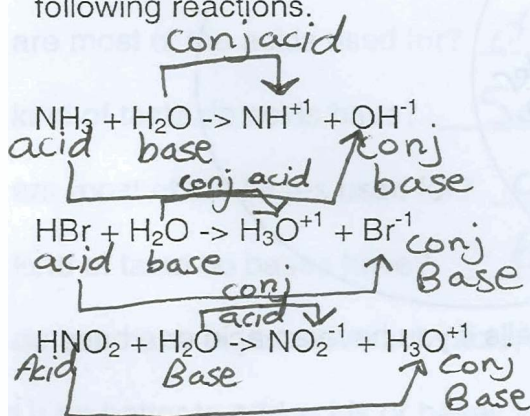
C₂H₆ B

Mg(OH)₂ B

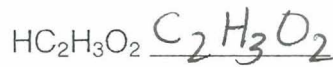
8. What is a conjugate base? The species produced when an acid donates a hydrogen ion to a base

9. What is a conjugate acid? The species produced when a base accepts a hydrogen ion from an acid

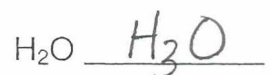
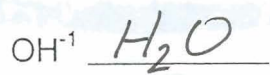
10. Label the acid (A), base (B), conjugate acid (CA), and conjugate base (CB) in the following reactions.



11. Write the formula for the conjugate base of each acid.



12. Write the formula of the conjugate acid for each base.



13. Your stomach uses acid to help digest the food you eat. When the stomach contains too much acid, a person will use an antacid (like Alka-Seltzer). Antacids decrease the amount of acid, making the person feel better. Why do medications like antacids decrease the amount of acid in the stomach?

The antacids help dissolve the acids quicker.

14. Would you predict most medications to be acids or bases? Why?

Bases because the human stomach already contains acids and the bases counter-react the acids.

15. Most of the foods you eat are acids. What would happen if you ate too many acidic foods? How could you fix it?

If you eat too many acids you get heart burn, you can fix it by taking antacids.

16. What happens when acids and bases mix together? When acids and bases are mixed together they become neutral.

17. What is the danger of eating a base (like a cleaning product)? You would probably get sick because it isn't safe to take in bases such as window cleaner.