

- The final exam covers January 26 through this week.
- There is now a Review Sheet online
- Each homework this week has *some* review
- Doing the review problems on the homework this week will not be enough review

Purpose:

What is a conjugate acid?.

Warmup :

(Grab a textbook. From p. 597, finish these in your notes)

A conjugate acid is...the particle formed when a base gains a hydrogen ion

BASE

PROTON
ACCEPTOR

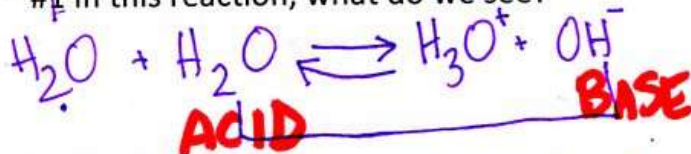
these two

ARE
CONJUGATES

ACID

PROTON
DONOR

#1 In this reaction, what do we see?



THE DOUBLE ARROW TELLS US
THE REACTION IS REVERSIBLE

#2 If given a substance, predict its conjugate,
using the rule you wrote in today's warmup:

ACID	BASE
H₂O	OH⁻
H₃O⁺	H₂O
HSO₄⁻	SO₄²⁻

What is the conjugate ~~base~~
base of NH_4^+ ?
Answer: NH_3

WHAT IS THE CONJUGATE BASE
of NH_3 ?
Answer: NH_2^-

acid math
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E

Name _____
 Period _____

pH	pOH	[H ⁺]	[OH ⁻]
10.39 (10.40)	3.60	⊕ 4x10 ⁻¹¹	2.5x10 ⁻⁴
17	-3 ⊕	1x10 ⁻¹⁷	1000
11.7	2.3	1.96x10 ⁻¹²	5.09x10 ⁻³
11.3	2.7	5.01x10 ⁻¹²	2.00x10 ⁻³

Complete and balance each reaction

NOTE: all of the acidic H's will react. If a molecule has H₂SO₄, both of the H's will react, for example.

- Mg + HBr Check a box first: This reaction is metal with acid base with acid

$$\underline{Mg} + \underline{HBr} \rightarrow \underline{H_2} + \underline{MgBr_2}$$
- Ca(OH)₂ + HBr Check a box first: This reaction is metal with acid base with acid

$$\underline{Ca(OH)_2} + \underline{2HBr} \rightarrow \underline{H_2O} + \underline{CaBr_2}$$
- Na + HNO₃ Check a box first: This reaction is metal with acid base with acid

$$\underline{2Na} + \underline{2HNO_3} \rightarrow \underline{H_2} + \underline{2NaNO_3}$$
- NaOH + H₂SO₄ Check a box first: This reaction is metal with acid base with acid

$$\underline{2NaOH} + \underline{H_2SO_4} \rightarrow \underline{2H_2O} + \underline{Na_2SO_4}$$
- Ca + H₃PO₄ Check a box first: This reaction is metal with acid base with acid

$$\underline{3Ca} + \underline{2H_3PO_4} \rightarrow \underline{3H_2} + \underline{Ca_3(PO_4)_2}$$
- LiOH + H₃PO₄ Check a box first: This reaction is metal with acid base with acid

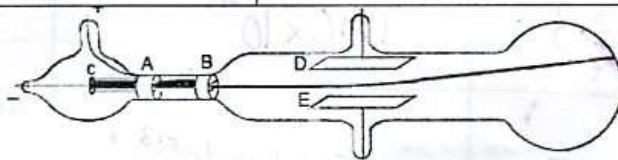
$$\underline{3LiOH} + \underline{H_3PO_4} \rightarrow \underline{3H_2O} + \underline{Li_3PO_4}$$

Write the full name of each compound shown below

1. Ag_2S silver sulfide	4. $\text{Zn}_3(\text{PO}_4)_2$ Zinc phosphate
2. PbO_3 lead(VI) oxide	5. ZnCO_3 zinc carbonate
3. Pb_2O_3 lead(III) oxide	6. Fe_2O_3 iron(III) oxide

Write the formula of each compound shown below

7. sodium phosphate Na_3PO_4	10. magnesium nitrite $\text{Mg}(\text{NO}_2)_2$
8. copper (II) nitrate $\text{Cu}(\text{NO}_3)_2$	11. tin(IV) oxide SnO SnO_2
9. copper (II) nitride Cu_3N_2	12. Aluminum iodide AlI_3

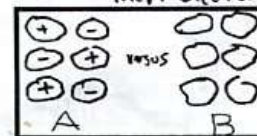


13. What did JJ Thomson conclude was shooting in a line from left to right in this drawing?

~~(circle cathode rays)~~

negatively charged particles (as opposed to rays). He named them electrons

Mark yes or no for each statement below about the particles of matter shown here



14. NO If dissolved in water, Substance B would probably conduct electricity
15. yes Substance B will melt at a lower temperature than Substance A
16. NO The one most likely to be a molecular substance is Substance A

17. When you ripped the tapes apart in the Sticky Tape Lab, the two pieces of tape were then attracted to each other. An hypothesis was proposed to account for this observation. Which of the following features of the hypothesis is NOT supported by this observation alone?

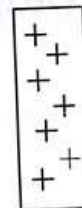
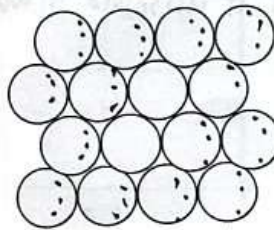
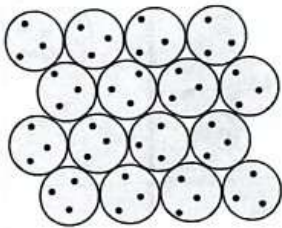
- Some charged particle was transferred between atoms of the two tapes.
- Atoms contain smaller particles that carry an electric charge.
- The smaller, charged particle in the atom is negatively charged.
- The smaller, charged particle in the atom is mobile.

18. Which of the following substances would you expect to conduct electricity?

Answers:
A and B

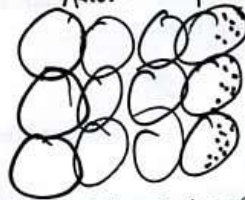
- a. bleach (a solution of sodium hypochlorite, NaOCl , in water)
- b. dry baking soda (NaHCO_3)
- c. rubbing alcohol ($\text{C}_3\text{H}_8\text{O}$)
- d. sugar ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) dissolved in water

19. Below left is group of neutral atoms of paper. At the right, draw electrons as dots to sketch how you imagine the electrons would be arranged if a (+) tape were placed to the right of the sample of paper. Briefly state your reasoning for your diagram.



e^- are attracted to the (+) tape

Another possible correct answer:



20. Circle one choice below. The image here is a good description of a compound made from only

- a. sulfur and oxygen
- b. potassium and chlorine



21. The atoms in a molecular solid are arranged in a nice orderly array similar to the crystal lattice shown in the previous question. However, there are key differences. State two ways in which a molecular substance differs from an ionic substance.

<p>One way:</p> <p>1) Lower melting pt</p> <p>2) Does not conduct electricity if dissolved in water</p>	<p>Another way:</p>
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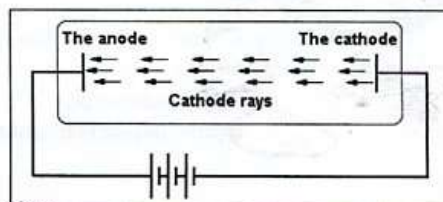
22. In $(\text{NH}_4)_2\text{CO}_3$

a. What is the total number of cations formed when it dissolves? 2

b. What is the total number of anions formed when it dissolves? 1

23. In Thomson's Cathode ray tube, electrons flew from the cathode to the anode in the vacuum of a tube similar to this one.

In the space below, draw circular 'plum pudding' atoms with black electron dots, similar to those in previous answers, to show, microscopically, what would be happening to the metal atoms in the cathode during this experiment.



ANODE:

CATHODE:

