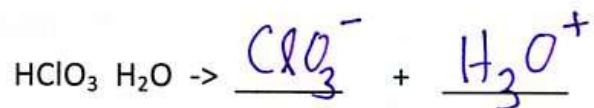


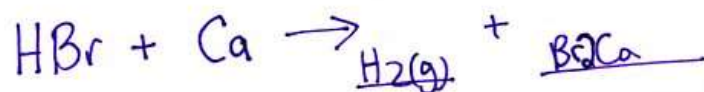
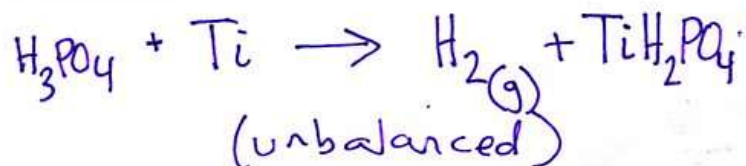
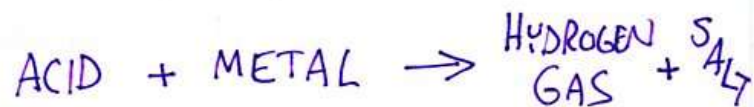
FINAL EXAM is second semester only  
FINAL REVIEW given tomorrow

Purpose: What are four basic skills for  
Acid-Base Chemistry?

Warmup, complete this reaction of  
acid and water by 11:11 for a stamp:



#1 WHAT DO ACIDS DO  
TO METALS



#2 LOG practice

<u>Number</u>	<u>LoG[number]</u>
333	<input data-bbox="613 443 842 520" type="text" value="?"/>
<input data-bbox="383 548 613 625" type="text" value="?"/>	2.68
6,250,000	<input data-bbox="621 636 854 714" type="text" value="?"/>
<input data-bbox="362 762 594 840" type="text" value="?"/>	4.002

## #2 LOG practice

number	LOG[number]
333	2.522
478	2.68
6,250,000	6.795
10046	4.002

## #3 How to calculate $[H^+]$

Recall the formula

$$\text{concentration} = \frac{\text{moles}}{\text{volume}}$$

words

$$M = \frac{\text{mol}}{L}$$

units

Square brackets mean  
"the concentration  
of \_\_\_\_\_ in moles/liter"

Therefore

$$[H^+] = 0.33 M$$

~~#~~ means the concentration of hydronium is 0.33 moles per liter

---

#4 How to calculate pH

memorize

$$pH = -\log [H^+]$$

$$pOH = -\log [OH^-]$$

IN WATER

$$1 \times 10^{-14} = [H^+][OH^-]$$

---

HINT FOR SOLVING TONIGHT'S "C" Homework

#11 A SOLUTION

$$\text{pH} = -\log[\text{H}^+]$$

$$3.494 = -\log[\text{H}^+]$$

$$-3.494 = \log[\text{H}^+]$$

NOW USE THE  
INVERSE LOG  
FUNCTION

CASIO CALCULATORS

~~SHIFT~~  
[-3.494] [SHIFT] [LOG]

TEXAS INSTRUMENTS CALCULATORS

[2nd] [ ]

### Bronsted Lowry Definition of Acids

Chemistry: <http://genest.weebly.com>

Stop in for help every day at lunch and Tues, & Thurs after school!

# B

Name \_\_\_\_\_

Period \_\_\_\_\_

Write the definition of each:

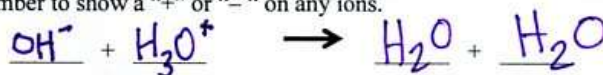
1. Arrhenius Acid: A ~~MOLE~~ SUBSTANCE WITH AN "H<sup>+</sup>" TO GIVE
2. Arrhenius Base: A substance with CATION ON LEFT and "OH" on right
3. Bronsted Acid: A SUBSTANCE THAT DONATES A "H<sup>+</sup>" (H<sup>+</sup> is called a proton)
4. Bronsted Base: A substance that accepts a H<sup>+</sup>

Mark each as (1) acid only (2) base only (3) both acid and base (4) true for pure water (5) none of these choices is true

5. 2 has lots of OH<sup>-</sup>, less H<sub>3</sub>O<sup>+</sup>
6. 5 has **no** ions
7. 3 is considered an electrolyte
8. 1 H<sub>2</sub>SO<sub>4</sub>
9. 3 can turn indicator paper various colors
10. 2 turns phenolphthalein pink
11. 2 tastes bitter
12. 2 feels slippery on skin
13. Write the reaction showing the ionization of water to produce two ions. Remember to show a + or - on any ions.



14. Write the reaction showing the reaction of hydroxide with hydronium to produce two water molecules. Remember to show a "+" or "-" on any ions.



15. What happens to the hydroxide concentration in water when acid is added?  
( it rises / falls / it doesn't change )
16. What happens to the hydronium concentration in water when acid is added?  
( it rises / it falls / it doesn't change )
17. What happens to the hydroxide concentration in water when base is added?  
( it rises / it falls / it doesn't change )
18. What happens to the hydronium concentration in water when base is added?  
( it rises / it falls / it doesn't change )

## Bronsted ACIDS - GIVE $H^+$

19. The following substances act as Bronsted acids in water. Write a chemical equation for each that illustrates its reaction with water.

ammonium ion, $NH_4^+$	$NH_4^+ + HOH \rightarrow NH_3 + H_3O^+$
$H_3PO_4$	$H_3PO_4 + HOH \rightarrow H_2PO_4^- + H_3O^+$
HBr	$HBr + HOH \rightarrow Br^- + H_3O^+$

## BRONSTED BASES

20. The following substances act as Bronsted bases in water. Write a chemical equation for each that illustrates its reaction with water.

$CHOO^-$	$CHOO^- + HOH \rightarrow CHOOH + OH^-$
hydride ion: $H^-$	$H^- + HOH \rightarrow H_2 + OH^-$
ammonia $NH_3$	$NH_3 + HOH \rightarrow NH_4^+ + OH^-$