

Chemistry Ch.19 Practice

Name: CALVIN

Date:

Hour: (or if pH=7)

1) A water solution is neutral if $[H_3O^+] = [OH^-]$

a) Term that applies to water's ability to act as an acid or a base amphoteric

2) Name and formula for two STRONG bases: Reasonable

Name and formula for two STRONG acids:

	<u>Acids</u>	<u>Bases</u>
a) Bronsted and Lowry	donate proton	accept proton
b) Lewis	accept E^- pair	donate E^- pair
c) Arrhenius	increase $[H_3O^+]$	increase $[OH^-]$

4) A strong acid and a strong base will react to form what 2 products?

5) Find the pOH if pH is:

- N a) 7.00 7
- A b) 4 10
- B c) 12 2
- A d) 2.5 11.5
- B e) 8.12 5.88

6) Find the pH if pOH is:

- B a) 2 12
- B b) 3.67 10.33
- A c) 14 0
- B d) 0 14
- B e) 5.1 8.9

7) Go back and place an "A" or "B" next to each in problems 5 and 6 to indicate whether they are an acid or a base.

8) Explain the difference between "Strong" and "Concentrated" with respect to acids and bases.

9) Find the pH values if $[\text{H}_3\text{O}^+]$ is:

- | | | |
|---------------------------------|----|---|
| a) $1 \times 10^{-2} \text{M}$ | 2 | A |
| b) $1 \times 10^{-12} \text{M}$ | 12 | B |
| c) $1 \times 10^{-14} \text{M}$ | 14 | B |
| d) $1 \times 10^{-8} \text{M}$ | 8 | B |
| e) $1 \times 10^{-4} \text{M}$ | 4 | A |

10) Find the $[\text{H}_3\text{O}^+]$ if $[\text{OH}^-]$ is:

- | | | |
|----------------------------------|---------------------------------|---|
| a) $1 \times 10^{-3} \text{M}$ | $1 \times 10^{-11} \text{M}$ | B |
| b) $1 \times 10^{-7} \text{M}$ | $1 \times 10^{-7} \text{M}$ | N |
| c) $1 \times 10^{-1} \text{M}$ | $1 \times 10^{-13} \text{M}$ | B |
| d) $1 \times 10^{-5} \text{M}$ | $1 \times 10^{-9} \text{M}$ | B |
| e) $3.2 \times 10^{-3} \text{M}$ | $3.13 \times 10^{-12} \text{M}$ | B |
| f) $5.4 \times 10^{-6} \text{M}$ | $1.85 \times 10^{-9} \text{M}$ | B |

11) Determine the $[\text{H}_3\text{O}^+]$ for the following pH values:

- | | | |
|----------|--------------------------------|---|
| a) 2.32 | $4.79 \times 10^{-3} \text{M}$ | A |
| b) 4.56 | $2.75 \times 10^{-5} \text{M}$ | A |
| c) 7.00 | $1 \times 10^{-7} \text{M}$ | N |
| d) 1.00 | $1 \times 10^{-1} \text{M}$ | A |
| e) 14.00 | $1 \times 10^{-14} \text{M}$ | B |
| f) 8.62 | $2.40 \times 10^{-9} \text{M}$ | B |
| g) 6.99 | $1.02 \times 10^{-7} \text{M}$ | A |

12) USING the pH values from the previous problem: indicate whether each is acidic or basic by writing a CAPITAL letter to the right of each answer above.

13) Determine the pH values for the following $[\text{OH}^-]$:

- | | |
|------------------------------------|------|
| a) $3.14 \times 10^{-5} \text{M}$ | 9.50 |
| b) $6.89 \times 10^{-12} \text{M}$ | 2.84 |
| c) $4.21 \times 10^{-9} \text{M}$ | 5.62 |

14) Find pOH, [Hydroxide], and pH for [Hydronium] = $2.34 \times 10^{-6} \text{ M}$.

$$\text{pOH} = 8.37 \quad \text{pH} = 5.63$$

$$[\text{OH}^-] = 4.27 \times 10^{-9} \text{ M} \quad [\text{H}_3\text{O}^+] = 2.34 \times 10^{-6} \text{ M}$$

15) Find pH, [Hydronium], and pOH for [Hydroxide] = $1.75 \times 10^{-2} \text{ M}$

$$\text{pH} = 12.2$$

$$\text{pOH} = 1.76$$

$$[\text{H}_3\text{O}^+] = 5.71 \times 10^{-13}$$

$$[\text{OH}^-] = 1.75 \times 10^{-2}$$

16) Find pH, $[\text{H}_3\text{O}^+]$, and $[\text{OH}^-]$, if pOH is 2

$$\text{pH} = 12$$

$$\text{pOH} = 2$$

$$[\text{H}_3\text{O}^+] = 1 \times 10^{-12} \text{ M}$$

$$[\text{OH}^-] = 1 \times 10^{-2} \text{ M}$$

17) Find the pOH, $[\text{H}_3\text{O}^+]$, and $[\text{OH}^-]$, if pH is 6.4

$$\text{pH} = 6.4$$

$$\text{pOH} = 7.6$$

$$[\text{H}_3\text{O}^+] = 3.98 \times 10^{-7} \text{ M}$$

$$[\text{OH}^-] = 2.51 \times 10^{-8} \text{ M}$$

18) Describe what an acid/base indicator is and give TWO examples.

19) Find pH if:

↪ changes color with pH

a) [Hydronium] = $1.23 \times 10^{-7} \text{ M}$ 6.91

b) [Hydroxide] = $4.56 \times 10^{-12} \text{ M}$ 2.66

c) [Hydronium] = $7.52 \times 10^{-3} \text{ M}$ 2.12

Ex.// pH paper

• litmus paper

• rainbow indicator

• phenolphthalein

• red cabbage juice

• etc...

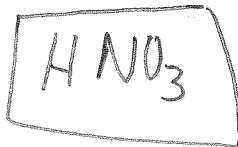
20) Give names for the following acids:

a) HCl Hydrochloric acid

b) H_2SO_4 Sulfuric acid

c) H_3PO_4 Phosphoric acid

21) Give a formula for the acid called "Nitric acid."



GO VIKINGS!!!