

HW02 - Water, Acids & Bases II

1 7 points



Select all seven strong acids below:

- HF
- HCl
- HI
- HBr
- H₂SO₄
- HAt
- HClO₄
- HNO₃
- NaOH
- HClO
- HClO₃

2 5 points



What is the pH of a 0.044 M HI solution?
Note: Report your answer to two sig figs (pH = X.XX)

Type your answer...

3 5 points



What is the [OH⁻] when 0.0023 moles of Ca(OH)₂ are placed in 654 mL water? Assume complete dissociation of Ca(OH)₂.

- 0.0035 M
- .0070 M
- 2.15 M
- 3.5 x 10⁻⁶ M
- 12.0 M

4 5 points



Use the data [here](#) to rank the following weak acids from **weakest** to **strongest**.

HIO
CH₃COOH
HCN
HF
HNO₂

- HIO < HCN < CH₃COOH < HNO₂ < HF
- HCN < HIO < CH₃COOH < HNO₂ < HF
- HNO₂ < HF < HIO < HCN < CH₃COOH
- HF < HNO₂ < CH₃COOH < HCN < HIO

5 5 points



A 0.5 M sample of a weak acid, HA₁, has a pH = 4.24. A 0.5 M sample of another weak acid, HA₂, has a pH = 5.66. Which weak acid has the larger K_a value?

- HA₂
- HA₁
- Both will have the same value of K_a

6 5 points



The generic weak acid HA has a percent ionization equal to 10.8% at a 0.025 M concentration. What is the pH?
Note: Report your answer to two sig figs (pH = X.XX)

Type your answer...

7 3 points



Which of the following represents a generic neutralization reaction of a strong acid and strong base?

- Acid + Base → Salt + Water
- Acid + Base → Weak Base + Water
- Acid + Base → Weak Acid + Water
- Acid + Base → Acid + Water
- Acid + Water → Base + Salt
- Base + Water → Acid + Salt

8 5 points



Consider the classic strong acid/base neutralization reaction of hydrochloric acid (HCl) and sodium hydroxide (NaOH) from HW01.



How many mL of 0.0448 M NaOH are needed to neutralize 32.0 mL of 0.0291 M HCl?

- 36.3 mL
- 20.8 mL
- 24.8 mL
- 33.7 mL
- 27.1 mL
- 49.3 mL

9 5 points



A titration experiment is set up to fully neutralize a strong acid (HCl) using a strong base (NaOH). The HCl has a concentration of 0.01 M and a volume of 100 mL. The NaOH also has a concentration of 0.01 M. What volume of NaOH is needed to fully neutralize the HCl?

- 50 mL
- 200 mL
- 100 mL
- 250 mL
- 20 mL
- 500 mL

10 5 points



Barium hydroxide is a strong base that dissociates based on the following reaction:



What volume of 0.005 M HCl (strong acid) is needed to fully neutralize a 500 mL 0.005 M Ba(OH)₂ solution?

- 1.00 L
- 500 mL
- 1.00 mL
- 750 mL
- 250 mL
- 2.50 L

11 5 points



What is the pH at the equivalence point of a titration involving a strong acid titrant and strong base analyte?

- pH = 7
- pH < 7
- pH > 7

12 5 points



What is the pH at the equivalence point of a titration involving a strong acid titrant and a weak base analyte?

- pH = 7
- pH < 7
- pH > 7

13 5 points



What is the pH at the equivalence point of a titration involving a strong base titrant and a weak acid analyte?

- pH > 7
- pH = 7
- pH < 7

14 5 points



Neutralizing an olympic size swimming pool is conceptually very similar to performing a massive titration experiment. Suppose a 700 thousand gallon swimming pool has a pH = 9.33 which is a bit too high for swimming. Calculate how many gallons of 10 M HCl (strong acid) it will take to neutralize the swimming pool to pH = 7. Report your answer to exactly 2 significant figures.

Type your answer...

15 5 points



What atmospheric component is responsible for the natural acidity of rain?

- Carbon dioxide
- Sulfuric acid
- Ozone
- Oxygen

16 5 points



Which two methods can be used to make sea water drinkable?

- distillation
- osmosis
- reverse osmosis
- flocculation

17 5 points



The pH of rain water falling through an unpolluted atmosphere is closest to...

- 4.8
- 5.4
- 7.0
- 8.7

18 5 points



Most aquatic life in lakes cannot survive in water with a pH less than...

- 5
- 7
- 8
- 14

19 5 points



The acid neutralizing capacity of a lake or stream most often derives from the presence of _____ in the surrounding soil or rock.

- CaCO₃
- HNO₃
- NaOH
- H₃O⁺

20 5 points



When Lake Travis is full, it holds about 369 billion gallons. If we pretend that Lake Travis has a neutral pH (pH = 7), approximately how many moles of H⁺ are present in the lake? 1 gal = 3.785 L

- 1.40 x 10⁵ moles
- 3.69 x 10⁴ moles
- 3.69 x 10⁹ moles
- 1.39 x 10⁸ moles
- 138 moles
- 4.65 x 10⁸ moles
- 1.00 x 10⁻⁷ moles