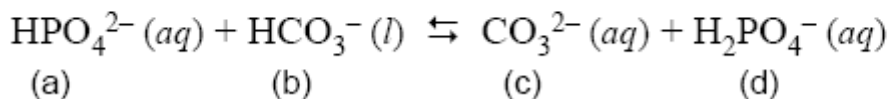


1. Identify the acid on the left and its conjugate base on the right. Similarly, identify the base on the left and its conjugate acid on the right.



(a) and (d) goes together, and (b) and (c) goes together.

Acid: (b) and (d)

Base: (a) and (c)

2. Does equilibrium lies primarily to the right or to the left?

Question 2 data

HPO_4^{2-}	$K_a = 3.6 \times 10^{-13}$
HCO_3^-	$K_a = 5.61 \times 10^{-11}$
H_2PO_4^-	$K_a = 6.23 \times 10^{-8}$

... HPO_4^{2-} is base. HCO_3^- and

H_2PO_4^- are acid

You need to know which acid is stronger.

-Bigger K_a on left => Equilibrium lies on the right.

-Bigger K_a on right => Equilibrium lies on the left.

Therefore, equilibrium lies primarily to the left.

- Equilibrium doesn't necessarily have to be at pH7. Equilibrium= moles of acid is equal to moles of base.

Example of strong base calculations

Similar to Practice Exercises, pp. 683-684

- a) What is the pH of a 0.0012 M NaOH solution?
b) If the pH of a solution of the strong base $\text{Sr}(\text{OH})_2$ is 10.46, what is the concentration of $\text{Sr}(\text{OH})_2$ in mol/L?

- (a) Strong base (Arrhenius base)

NaOH when added to water completely dissociates 1 mol NaOH to water \rightarrow 1 mol Na^+ and 1 mol OH^- 0.0012M OH^- solution.

$$[\text{OH}^-] = 0.0012\text{M}$$

$$\text{pOH} = -\log(0.0012) = 2.92$$

$$\text{pH} + \text{pOH} = 14$$

$$\Rightarrow \text{pH} = 14 - 2.92 = 11.08$$

...check sig.fig.

- (b) pH = 10.46

Goal:

Get the concentration of $\text{Sr}(\text{OH})_2$.

Find concentration of $[\text{OH}^-]$.

Get that from pOH

Get pOH from the pH

$$\text{pOH} = 14 - \text{pH} = 14 - 10.46 = 3.54$$

$$[\text{OH}^-] = 10^{-\text{pOH}} = 10^{-3.54} = 0.000288\text{M}$$

$$0.000288 \text{ (mol OH}^- \text{ / L)} \times \frac{(1 \text{ mol Sr}(\text{OH})_2)}{(2 \text{ mol OH}^-)} = 0.000144\text{M is the Sr}(\text{OH})_2 \text{ concentration.}$$