

Chapter 13 & 14 — Review Set

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1. Calculate:

(a) pH when $[\text{OH}^-] = 2.3 \cdot 10^{-6}$

$$-\log_{10} \left(\frac{1 \cdot 10^{-14}}{2.3 \cdot 10^{-6}} \right) = 8.36 \quad (1)$$

(b) pOH when $[\text{H}_3\text{O}^+] = 2.8 \cdot 10^{-8}$

$$-\log_{10} \left(\frac{1 \cdot 10^{-14}}{2.8 \cdot 10^{-8}} \right) = 6.45 \quad (2)$$

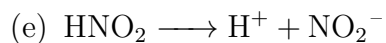
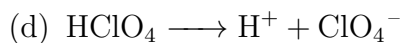
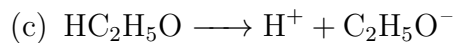
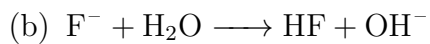
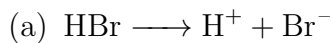
(c) $[\text{H}_3\text{O}^+]$ when pH is 8.53

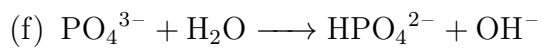
$$10^{-8.53} = 2.95 \cdot 10^{-9} [\text{M}] \quad (3)$$

(d) $[\text{OH}^-]$ when pH is 2.36

$$\frac{1 \cdot 10^{-14}}{10^{-2.36}} = 2.29 \cdot 10^{-12} [\text{M}] \quad (4)$$

2. Write the dissociation equation:





3.

$$\begin{aligned}\frac{x^2}{1.5} &= .00014 \\ x &= .0145[\text{M}]\end{aligned}\tag{5}$$

4.

$$\begin{aligned}\frac{x^2}{.126} &= 1.5 \cdot 10^{-9} \\ x &= \sqrt{.126 \cdot 1.5 \cdot 10^{-9}} \\ 14 + \log_{10}(x) &= 9.14\end{aligned}\tag{6}$$

5.

$$\begin{aligned}[\text{H}^+] &= 10^{-9.8} = 1.585 \cdot 10^{-10} \\ [\text{OH}^-] &= 6.31 \cdot 10^{-5} \\ \frac{(6.31 \cdot 10^{-5})^2}{.0278} &= 1.432 \cdot 10^{-7} [\text{M}]\end{aligned}\tag{7}$$

6.

$$\frac{.3 \cdot .5 + .42 \cdot .137}{.72} = .28825[\text{M}]\tag{8}$$

7. (a)

(9)

(b)

(10)

8. (a)

(11)

(b)

(12)

9.

(13)

10.

(14)