HBr

5. A 9.07×10^{-9} solution of hydrobromic acid is made.
What is the concentration of hydronium?

$[H_3O^+] = 9.07 \times 10^{-9}\ M$

What is the hydroxide concentration?

$[OH^-] = \frac{1 \times 10^{-14}}{9.07 \times 10^{-9}} = 1.10 \times 10^{-6} M$

What is the pH?

$-\log(9.07 \times 10^{-9}) = 8.04$

What is the pOH?

$14 - 8.04 = 5.96$

$Al(OH)_3$

6. A 4.65×10^{-1} M solution of aluminum hydroxide is made.
What is the concentration of hydronium?

$[H_3O^+] = \frac{1 \times 10^{-14}}{1.40} = 7.14 \times 10^{-15} M$

What is the hydroxide concentration?

$[OH^-] = 3(4.65 \times 10^{-1}) = 1.395 = 1.40 M$

What is the pH?

$14 + .146 = 14.146$

What is the pOH?

$-\log(1.40) = -.146$

HCl

7. A 0.072 M solution of hydrochloric acid is made.
What is the concentration of hydronium?

$[H_3O^+] = .072 M$

What is the hydroxide concentration?

$[OH^-] = \frac{1 \times 10^{-14}}{.072} = 1.39 \times 10^{-13}$

What is the pH?

$-\log(.072) = 1.14$

What is the pOH?

$14 - 1.14 = 12.86$

HCl

8. If the pH of a hydrochloric solution is 4.5,
What is the concentration of hydronium?

$[H_3O^+] = \text{antilog}(-4.5) = 3.2 \times 10^{-5} M$

What is the hydroxide concentration?

$[OH^-] = \text{antilog}(-9.5) = 3.2 \times 10^{-10} M$

What is the molarity of the solution?

$3.2 \times 10^{-5} M$

What is the pOH?

$14 - 4.5 = 9.5$