

Worksheet: Hydronium and Hydroxide Concentrations



Q1: A solution of carbon dioxide in water has a hydronium ion concentration of 2.0×10^{-6} M. What is the concentration of hydroxide ions at 25°C ? K_w at 25°C is 1.0×10^{-14} .

A 1.0×10^{-14} M

B 2.0×10^{-6} M

C 2.0×10^{-20} M

D 2.0×10^8 M

E 5.0×10^{-9} M

Q2: What is the hydronium ion concentration in an aqueous solution with a hydroxide ion concentration of 0.001 M at 25°C ? K_w at 25°C is 1.0×10^{-14} .

A 1.0×10^{11} M

B 1.0×10^{-17} M

C 0.001 M

D 1.0×10^{-14} M

E 1.0×10^{-11} M

Q3: The hydroxide ion concentration in household ammonia is 3.2×10^{-3} M at 25°C . What is the concentration of hydronium ions in the solution?

A 1.0×10^{-2} M

B 7.2×10^{-15} M

C 3.2×10^{-3} M

D 3.1×10^{-12} M

E 9.0×10^{-5} M

Q4: The hydronium ion concentration in a sample of rainwater is found to be 2.3×10^{-6} M at 25°C . What is the concentration of hydroxide ions in the rainwater?

A 9.1×10^{-9} M

B 1.8×10^{-11} M

C 4.3×10^{-9} M

D 2.3×10^{-6} M

E 5.0×10^{-7} M

Q5: Lime juice has a pH of about 2.3. Given that the self-ionization constant of water, K_w , is 1.0×10^{-14} , what is the approximate hydroxide ion concentration of lime juice at 25°C?

A 2.0×10^{-12} M

B 5.0×10^{-3} M

C 9.3×10^{-7} M

D 2.2×10^{-9} M

E 4.5×10^{-6} M

Q6: The self-ionization constant of water, K_w , is 1.0×10^{-14} at 25°C. What is the hydronium ion concentration in pure water at this temperature?

A 1.0×10^{-28} M

B 5.0×10^{-8} M

C 1.0×10^{-14} M

D 1.0×10^{-7} M

E 5.0×10^{-15} M