

Formulas:	$K_w = [\text{H}_3\text{O}^+][\text{OH}^-]$	$\text{pH} = -\log [\text{H}_3\text{O}^+]$	$\text{pOH} = -\log [\text{OH}^-]$
		$[\text{H}_3\text{O}^+] = 10^{-\text{pH}}$	$[\text{OH}^-] = 10^{-\text{pOH}}$

1. Complete the following tables:

Acid or Base	$[\text{H}_3\text{O}^+]$	$[\text{OH}^-]$	pH	pOH
2.00 mol/L nitric acid				
2.50 mol/L $\text{NaOH}_{(\text{aq})}$				
0.200 mol/L $\text{HCl}_{(\text{aq})}$				
0.290 mol/L $\text{Sr}(\text{OH})_{2(\text{aq})}$				
6.8 M hydroiodic acid				
0.000150 M $\text{Mg}(\text{OH})_{2(\text{aq})}$				
0.105 M $\text{HBr}_{(\text{aq})}$				
0.175 mol/L $\text{Ba}(\text{OH})_{2(\text{aq})}$				
2.00×10^{-3} M $\text{HNO}_{3(\text{aq})}$				
3.11×10^{-3} mol.L ⁻¹ KOH				
0.0035 M $\text{Ca}(\text{OH})_{2(\text{aq})}$				
4.6 mol/L $\text{HBr}_{(\text{aq})}$				

$[\text{H}_3\text{O}^+]$	$[\text{OH}^-]$	pH	pOH	Acidic or Basic
4.0×10^{-6} mol/L				
		9.500		
	2.00×10^{-11} mol/L			
10.0 M				
		15.105		
	4.4×10^{-2} mol/L			
		-0.48		
			-1.12	
			14.00	
		3.95		

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2. Calculate the pH and the pOH for each of the following solutions:
- a) 10.0 g of NaOH is dissolved to prepare 500.0 mL of solution
- b) 25.0 g of HCl is dissolved in 6.00 L of solution
- c) 0.500 g of $\text{Ca}(\text{OH})_2$ is dissolved to make 4.00 L of solution
- d) 40.0 mL of 8.00 mol/L nitric acid is diluted to a final volume of 500.0 mL
- e) 20.0 mL of a NaOH solution with a pH = 12.45 is diluted to a final volume of 100.0 mL
3. Explain how the pH of a $\text{HCl}_{(\text{aq})}$ solution changes when the molar concentration increases by a factor of:
- a) 10 _____

- b) 100 _____

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$[\text{H}_3\text{O}^+] = [\text{strong acid}]$