ACIDS, BASES, SALTS, AND BUFFER SOLUTIONS SMART WORKSHEET

PART A. MEASURING THE $\mathrm{pH}\xspace$ OF ACIDS AND BASES

Note: Only digits after the decimal point of a logarithmic value are significant

Table A1: pH data and concentration of hydronium ions and hydroxide ions calculations

Solution	$\hbox{Measured pH}$	1. Calculated $[\mathrm{H}^+]$, M		2. Calculated $[OH^-]$, M		
		Unrounded	Rounded	Unrounded	Rounded	
0.100 M HCl	1.46 ~	0.0346737	0.035	2.884030 ×10 ⁻¹³	2.9 ×10 ⁻¹³	
0.0100 M HCl	2.39	0.00407380	0.0041	2.45471 ×10 ⁻¹²	2.5 ×10 ⁻¹²	
0.00100 M HCl	3.04	0.000912011	0.00091	1.09648 ×10 ⁻¹¹	1.1 ×10 ⁻¹¹	
$0.100\mathrm{M}$ $\mathrm{CH_{3}COOH}$	3.07	0.000851138	0.00085		1.2 ×10 ⁻¹¹	
0.100 M NaOH	12.81	1.54882 ×10 ⁻¹³	1.5 ×10 ⁻¹³	0.0645653	0.065	
0.0100 M NaOH	11.85 ✓	1.41254×10 ⁻¹²	1.4×10 ⁻¹²	0.00707945	0.0071	
0.00100 M NaOH	10.25	5.62341 ×10 ⁻¹¹	5.6 ×10 ⁻¹¹	0.000177828	0.00018	
$0.100\mathrm{M}$ $\mathrm{NH_4OH}$	10.65	2.23872 ×10 ⁻¹¹	2.2 ×10 ⁻¹¹	0.000446684	0.00045	

YOUR PROGRESS ON MEASURING THE $pH\mbox{ of acids and bases section}$

CORRECT 32/32 POINTS AWARDEBO / 160 AUTOSOLVED 0 / 32 NOT FINISHED 0 / 40

PART B. MEASURING THE pH OF SALT SOLUTIONS

Table B1: Measured $pH\mbox{ data}$ and concept questions

Salt	Measured pH	Which of the salt's ions is $\textit{NOT}pH$ neutral?			
Sodium acetate, ${ m NaCH_3COO}$	8.15	△ CH ₃ CO ₂ [−]			
Sodium carbonate, $\mathrm{Na_{2}CO_{3}}$	11.47	<u> </u>			
Sodium hydrogen sulfate, NaHSO_4	1.42	HSO ₄ ⁻			
Sodium hydrogen carbonate, ${ m NaHCO_3}$	9.69	□ HCO ₃ -			

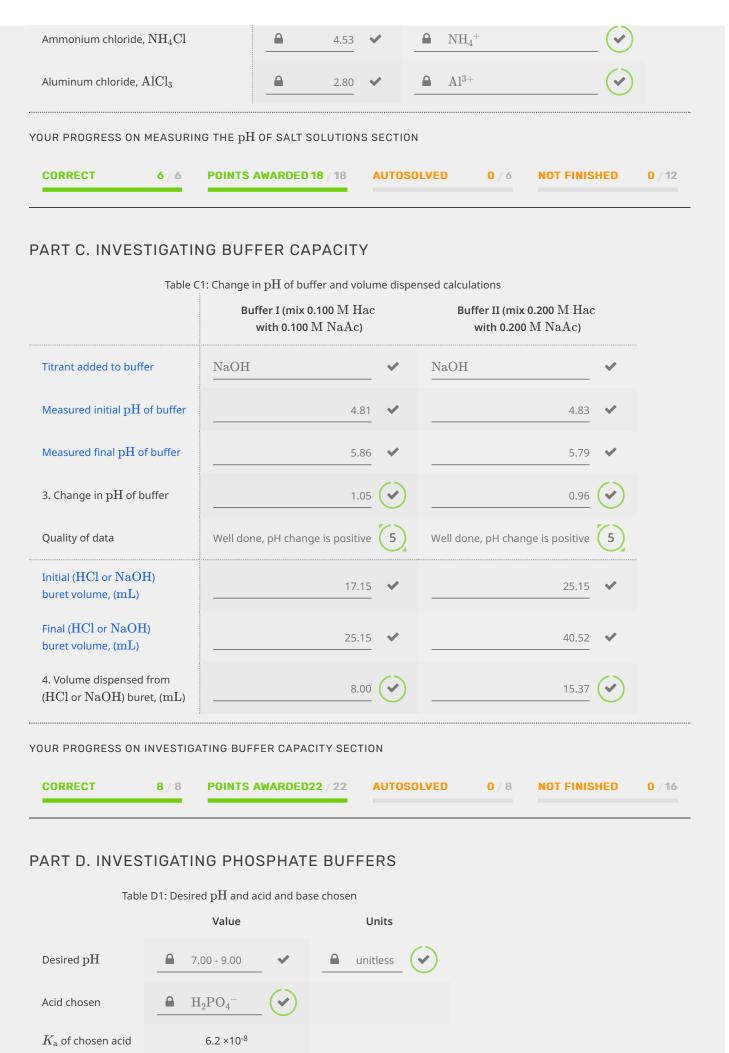


Table D2: pH of buffer calculation

 HPO_{4}^{2-}

Base chosen

	Unrounded	Rounded			Units
Volume of acid solution (mL)			10.00		
Volume of base solution (mL)		<u> </u>	10.00	~	

