

Worksheet 5 simple acid/base calcs

This is a large table of straight forward acid/base calculations that you should be able to do easily in your head without a calculator since I have made the numbers work out nicely. For all of these assume 25°C.

Substance	Concentration	K _a	K _b	[H ⁺]	[OH ⁻]	pH	pOH
HA	0.1 M	Strong	---	0.1M	10 ⁻¹³ M	1	13
NaOH	10 ⁻² M	---	Strong	10 ⁻¹² M	10 ⁻² M	12	2
HA	0.01 M	10 ⁻⁴	10 ⁻¹⁰	10 ⁻³ M	10 ⁻¹¹ M	3	11
NaA	1 M	10 ⁻⁴	10 ⁻¹⁰	10 ⁻⁹ M	10 ⁻⁵ M	9	5
HA	10 ⁻⁴ M	10 ⁻²					
KA	0.1M	10 ⁻³					
B	1 M		10 ⁻⁴				
(BH)Cl	0.01M		10 ⁻⁴				
HA	10 ⁻³ M	strong					
Ba(OH) ₂	0.5 M		strong				
HA	10 ⁻² M	strong					
HA	10 ⁻² M	10 ⁻⁶					
NaA	1M	10 ⁻⁶					
B	10 ⁻³ M		10 ⁻⁵				
(BH)NO ₃	10 ⁻¹ M		10 ⁻³				
HA	1M	10 ⁻⁴					

And now the same thing with a calculator and actual substances.

I've added a row for you to identify the compound in shorthand notation (HA, A⁻, B, BH⁺)

Substance	Short	Concentration	K _a	K _b	[H ⁺]	[OH ⁻]	pH	pOH
Acetic acid	HA	0.1 M	1.8x10 ⁻⁵	5.55 x10 ⁻¹⁰	1.3 x10 ⁻³	7.7x10 ⁻¹²	2.9	11.1
Nitric Acid		4x10 ⁻³ M						
KOH		2x10 ⁻² M						
Sodium Benzoate		0.3M	6.4x10 ⁻⁵					
Ammonia		2x10 ⁻³ M		1.8x10 ⁻⁵				
Ethyl Amine		0.1M		5.6x10 ⁻⁴				
Formic acid		0.1M	1.8x10 ⁻⁴					
Potassium formate		0.01M	1.8x10 ⁻⁴					
HF		10 ⁻³ M	6.3x10 ⁻⁴					
CaF ₂		0.5 M	6.3x10 ⁻⁴					
(NH ₄)Cl		10 ⁻² M		1.8x10 ⁻⁵				
Nitrous acid		10 ⁻² M	4x10 ⁻⁴					
K(CH ₃ COO)		2x10 ⁻² M	1.8x10 ⁻⁵					
HCl		10 ⁻⁴ M						