



calculatoratoz.com



unitsconverters.com

Buffer Solution Formulas

Calculators!

Examples!

Conversions!

Bookmark calculatoratoz.com, unitsconverters.com

Widest Coverage of Calculators and Growing - **30,000+ Calculators!**

Calculate With a Different Unit for Each Variable - **In built Unit Conversion!**

Widest Collection of Measurements and Units - **250+ Measurements!**

Feel free to SHARE this document with your friends!

[Please leave your feedback here...](#)



List of 11 Buffer Solution Formulas

Buffer Solution

1) Buffer Capacity

$$\text{fx } \beta = \frac{n_{a/b}}{d_{\text{pH}}}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$\text{ex } 2.5 = \frac{10}{4}$$

2) Concentration of Acid in Acidic Buffer using Henderson's Equation

$$\text{fx } C_{\text{acid}} = \frac{C_{\text{salt}}}{10^{\text{pH} - \text{pK}_a}}$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$\text{ex } 15.81139 \text{ mol/L} = \frac{50 \text{ mol/L}}{10^{3-2.5}}$$

3) Concentration of Base in Basic Buffer using Henderson's Equation

$$\text{fx } C_{\text{base}} = \frac{C_{\text{salt}}}{10^{\text{pOH} - \text{pK}_b}}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$\text{ex } 25.05936 \text{ mol/L} = \frac{50 \text{ mol/L}}{10^{8-7.7}}$$



4) Concentration of Salt in Acidic Buffer using Henderson's equation 

$$fx \quad C_{\text{salt}} = C_{\text{acid}} \cdot (10^{\text{pH} - \text{pK}_a})$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)


$$ex \quad 47.43416 \text{ mol/L} = 15 \text{ mol/L} \cdot (10^{3-2.5})$$

5) Concentration of Salt in Basic Buffer using Henderson's Equation 

$$fx \quad C_{\text{salt}} = C_{\text{base}} \cdot (10^{\text{pOH} - \text{pK}_b})$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)


$$ex \quad 49.88156 \text{ mol/L} = 25 \text{ mol/L} \cdot (10^{8-7.7})$$

6) Maximum pH of Basic Buffer 

$$fx \quad \text{pH} = 14 - \text{pK}_b$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$ex \quad 6.3 = 14 - 7.7$$

7) Maximum pOH of Acidic Buffer 

$$fx \quad \text{pOH} = 14 - \text{pK}_a$$

[Open Calculator !\[\]\(b64b40baaee5acddc1eab8538ba84754_img.jpg\)](#)

$$ex \quad 11.5 = 14 - 2.5$$

8) pH of Acidic Buffer using Henderson's Equation 

$$fx \quad \text{pH} = \text{pK}_a + \log 10 \left(\frac{C_{\text{salt}}}{C_{\text{acid}}} \right)$$

[Open Calculator !\[\]\(aff7c69c44a5e015f18c35867ef3f5c3_img.jpg\)](#)

$$ex \quad 3.022879 = 2.5 + \log 10 \left(\frac{50 \text{ mol/L}}{15 \text{ mol/L}} \right)$$



9) pK_a of Acidic Buffer using Henderson's Equation

$$\text{fx } \text{pK}_a = \text{pH} - \log_{10} \left(\frac{C_{\text{salt}}}{C_{\text{acid}}} \right)$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$\text{ex } 2.477121 = 3 - \log_{10} \left(\frac{50\text{mol/L}}{15\text{mol/L}} \right)$$

10) pK_b of Basic Buffer using Henderson's Equation

$$\text{fx } \text{pK}_b = \text{pOH} - \log_{10} \left(\frac{C_{\text{salt}}}{C_{\text{base}}} \right)$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$\text{ex } 7.69897 = 8 - \log_{10} \left(\frac{50\text{mol/L}}{25\text{mol/L}} \right)$$

11) pOH of Basic Buffer using Henderson's Equation

$$\text{fx } \text{pOH} = \text{pK}_b + \log_{10} \left(\frac{C_{\text{salt}}}{C_{\text{base}}} \right)$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

$$\text{ex } 8.00103 = 7.7 + \log_{10} \left(\frac{50\text{mol/L}}{25\text{mol/L}} \right)$$




Variables Used

- C_{acid} Concentration of Acid (Mole per Liter)
- C_{base} Concentration of Base (Mole per Liter)
- C_{salt} Concentration of Salt (Mole per Liter)
- d_{pH} Change in pH
- $n_{\text{a/b}}$ Number of Moles of Acid or Base
- pH Negative Log of Hydronium Concentration
- pK_a Negative Log of Acid Ionization Constant
- pK_b Negative Log of Base Ionization Constant
- pOH Negative Log of Hydroxyl Concentration
- β Buffer Capacity







Constants, Functions, Measurements used

- **Function:** **log10**, $\log_{10}(\text{Number})$
Common logarithm function (base 10)
- **Measurement:** **Molar Concentration** in Mole per Liter (mol/L)
Molar Concentration Unit Conversion 



Check other formula lists

- [Acidity and pH Scale Formulas](#) 
- [Buffer Solution Formulas](#) 
- [Ostwald Dilution Law Formulas](#) 
- [Relative Strength of Two acids Formulas](#) 

Feel free to SHARE this document with your friends!

PDF Available in

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

12/18/2023 | 2:10:28 AM UTC

[Please leave your feedback here...](#)

