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# Relative Strength of Two Acids Formulas

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# List of 13 Relative Strength of Two Acids Formulas


## Relative Strength of Two Acids

1) Concentration of Acid 1 given Relative Strength, Conc of Acid 2 and Degree of Diss of both Acids 

$$\text{fx } C_1 = \frac{R_{\text{strength}} \cdot C_2 \cdot \alpha_2}{\alpha_1}$$

Open Calculator 

$$\text{ex } 10\text{mol/L} = \frac{2 \cdot 20\text{mol/L} \cdot 0.125}{0.5}$$

2) Concentration of Acid 1 given Relative Strength, Conc of Acid 2 and Diss const of both Acids 

$$\text{fx } C'_1 = \frac{(R_{\text{strength}}^2) \cdot C_2 \cdot K_{a2}}{K_{a1}}$$

Open Calculator 

$$\text{ex } 0.0024\text{mol/L} = \frac{((2)^2) \cdot 20\text{mol/L} \cdot 4.5\text{E}^{-10}}{1.5\text{E}^{-5}}$$



### 3) Concentration of Acid 2 given Relative Strength, Conc of Acid 1 and Degree of Diss of both Acids

$$\text{fx } C_2 = \frac{C_1 \cdot \alpha_1}{R_{\text{strength}} \cdot \alpha_2}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235\_img.jpg\)](#)

$$\text{ex } 20\text{mol/L} = \frac{10\text{mol/L} \cdot 0.5}{2 \cdot 0.125}$$

### 4) Concentration of Acid 2 given Relative Strength, Conc of Acid 1 and Diss Const of both Acids

$$\text{fx } C_2 = \frac{C'_1 \cdot K_{a1}}{(R_{\text{strength}}^2) \cdot K_{a2}}$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0\_img.jpg\)](#)

$$\text{ex } 20\text{mol/L} = \frac{0.0024\text{mol/L} \cdot 1.5\text{E}^{-5}}{\left((2)^2\right) \cdot 4.5\text{E}^{-10}}$$

### 5) Concentration of Hydrogen Ion of Acid 1 given Relative Strength and Conc of Hydrogen Ion of Acid 2

$$\text{fx } (H_{+1}) = R_{\text{strength}} \cdot (H_{+2})$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f\_img.jpg\)](#)

$$\text{ex } 5\text{mol/L} = 2 \cdot 2.5\text{mol/L}$$



### 6) Concentration of Hydrogen Ion of Acid 2 given Relative Strength and Conc of Hydrogen Ion of Acid 1

$$\text{fx } (H^{+2}) = \frac{H_{+1}}{R_{\text{strength}}}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95\_img.jpg\)](#)

$$\text{ex } 2.5\text{mol/L} = \frac{5\text{mol/L}}{2}$$

### 7) Degree of Dissociation 1 given Relative Strength, Conc of both Acid and Degree of Diss 2

$$\text{fx } \alpha_1 = \frac{R_{\text{strength}} \cdot C_2 \cdot \alpha_2}{C_1}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2\_img.jpg\)](#)

$$\text{ex } 0.5 = \frac{2 \cdot 20\text{mol/L} \cdot 0.125}{10\text{mol/L}}$$

### 8) Degree of Dissociation 2 given Relative Strength, Conc of both Acid and Degree of Diss 1

$$\text{fx } \alpha_2 = \frac{C_1 \cdot \alpha_1}{R_{\text{strength}} \cdot C_2}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7\_img.jpg\)](#)

$$\text{ex } 0.125 = \frac{10\text{mol/L} \cdot 0.5}{2 \cdot 20\text{mol/L}}$$



### 9) Dissociation Constant 1 given Relative Strength, Conc of both Acid and Diss Const 2

$$\text{fx } K_{a1} = \frac{(R_{\text{strength}}^2) \cdot C_2 \cdot K_{a2}}{C'_1}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a\_img.jpg\)](#)

$$\text{ex } 1.5E^{-5} = \frac{((2)^2) \cdot 20\text{mol/L} \cdot 4.5E^{-10}}{0.0024\text{mol/L}}$$

### 10) Dissociation Constant 2 given Relative Strength, Conc of both Acid and Diss Const 1

$$\text{fx } K_{a2} = \frac{C'_1 \cdot K_{a1}}{(R_{\text{strength}}^2) \cdot C_2}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021\_img.jpg\)](#)

$$\text{ex } 4.5E^{-10} = \frac{0.0024\text{mol/L} \cdot 1.5E^{-5}}{((2)^2) \cdot 20\text{mol/L}}$$

### 11) Relative Strength of Two Acids given Concentration and Degree of Dissociations of both Acids

$$\text{fx } R_{\text{strength}} = \frac{C_1 \cdot \alpha_1}{C_2 \cdot \alpha_2}$$

[Open Calculator !\[\]\(bd3b31712ad9bab5a241210fa6925cdd\_img.jpg\)](#)

$$\text{ex } 2 = \frac{10\text{mol/L} \cdot 0.5}{20\text{mol/L} \cdot 0.125}$$



## 12) Relative Strength of Two Acids given Concentration and Dissociation Constant of both Acids

[Open Calculator !\[\]\(eafc244b53721dd1ec133f0772f70fc7\_img.jpg\)](#)

$$\text{fx } R_{\text{strength}} = \sqrt{\frac{C'_1 \cdot K_{a1}}{C_2 \cdot K_{a2}}}$$

$$\text{ex } 2 = \sqrt{\frac{0.0024\text{mol/L} \cdot 1.5\text{E}^{-5}}{20\text{mol/L} \cdot 4.5\text{E}^{-10}}}$$

## 13) Relative Strength of Two Acids given Concentration of Hydrogen Ion of both Acids

[Open Calculator !\[\]\(10f8862fc183b400327470ea85afe9ae\_img.jpg\)](#)

$$\text{fx } R_{\text{strength}} = \frac{H_{+1}}{H_{+2}}$$

$$\text{ex } 2 = \frac{5\text{mol/L}}{2.5\text{mol/L}}$$




## Variables Used

- $C_1$  Concentration of Acid 1 (Mole per Liter)
- $C'_1$  Conc. of Acid 1 given Dissociation Constant (Mole per Liter)
- $C_2$  Concentration of Acid 2 (Mole per Liter)
- $H_+1$  Hydrogen Ion Furnished by Acid 1 (Mole per Liter)
- $H^+2$  Hydrogen Ion Furnished by Acid 2 (Mole per Liter)
- $K_{a1}$  Dissociation Constant of Weak Acid 1
- $K_{a2}$  Dissociation Constant of Weak Acid 2
- $R_{\text{strength}}$  Relative Strength of Two Acids
- $\alpha_1$  Degree of Dissociation 1
- $\alpha_2$  Degree of Dissociation 2




## Constants, Functions, Measurements used

- **Function:** **sqrt**, sqrt(Number)  
*Square root function*
- **Measurement:** **Molar Concentration** in Mole per Liter (mol/L)  
*Molar Concentration Unit Conversion* 



## Check other formula lists

- [Acidity and pH Scale Formulas](#) 
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