Important Relative Strength of Two Acids Formulas PDF

Formulas
Examples
with Units

List of 13
Important Relative Strength of Two Acids Formulas

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

$$H_+1 = R_{strength} \cdot H^+2$$

Example with Units

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

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

Evaluate Formula

Formula

$$H^+2 = \frac{H_+1}{R_{strength}}$$

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

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

Example with Units

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

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

Evaluate Formula

Formula

$$R_{strength} = \frac{H_+1}{H^+2}$$

Example with Units

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

Variables used in list of Relative Strength of Two Acids Formulas above

- 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
- $R_{strength}$ Relative Strength of Two Acids
- α_1 Degree of Dissociation 1
- α_2 Degree of Dissociation 2

Constants, Functions, Measurements used in list of Relative Strength of Two Acids Formulas above

- Functions: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Measurement: **Molar Concentration** in Mole per Liter (mol/L)
  Molar Concentration Unit Conversion

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