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Pauling's Electronegativity Formulas

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List of 11 Pauling's Electronegativity Formulas

Pauling's Electronegativity

1) Covalent Ionic Resonance Energy using Pauling's Electronegativity

$$\text{fx } \Delta_p = X_P^2$$

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

$$\text{ex } 52.4176\text{J} = (7.24\text{J})^2$$

2) Covalent Radius given Pauling's Electronegativity

$$\text{fx } r_{\text{covalent}} = \sqrt{\frac{0.359 \cdot Z}{X_P - 0.744}}$$

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

$$\text{ex } 1.175423\text{\AA} = \sqrt{\frac{0.359 \cdot 25}{7.24\text{J} - 0.744}}$$


3) Effective Nuclear Charge given Pauling's Electronegativity

$$\text{fx } Z = \frac{(X_P - 0.744) \cdot (r_{\text{covalent}}^2)}{0.359}$$

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

$$\text{ex } 25.19507 = \frac{(7.24\text{J} - 0.744) \cdot ((1.18\text{\AA})^2)}{0.359}$$



4) Electron Affinity of element using Pauling's Electronegativity 

$$\text{fx } \text{E.A} = \left((\text{X}_P + 0.2) \cdot \left(\frac{2}{0.336} \right) \right) - \text{IE}$$

Open Calculator 

$$\text{ex } 17.08571\text{J} = \left((7.24\text{J} + 0.2) \cdot \left(\frac{2}{0.336} \right) \right) - 27.2\text{J}$$

5) Ionization Energy of Element using Pauling's Electronegativity 

$$\text{fx } \text{IE} = \left((\text{X}_P + 0.2) \cdot \left(\frac{2}{0.336} \right) \right) - \text{E.A}$$

Open Calculator 

$$\text{ex } 27.18571\text{J} = \left((7.24\text{J} + 0.2) \cdot \left(\frac{2}{0.336} \right) \right) - 17.1\text{J}$$

6) Pauling's Electronegativity from Allred Rochow's Electronegativity 

$$\text{fx } \text{X}_P = \text{X}_{A.R} + 0.744$$

Open Calculator 

$$\text{ex } 7.244\text{J} = 6.5\text{J} + 0.744$$

7) Pauling's Electronegativity from Mulliken's Electronegativity 

$$\text{fx } \text{X}_P = (0.336 \cdot \text{X}_M) - 0.2$$

Open Calculator 

$$\text{ex } 7.192\text{J} = (0.336 \cdot 22\text{J}) - 0.2$$




8) Pauling's Electronegativity given Bond Energies 

$$\text{fx } X_P = \sqrt{E_{(A-B)} - \left(\sqrt{E_{A-A} \cdot E_{B-B}} \right)}$$

Open Calculator 

$$\text{ex } 7.227178\text{J} = \sqrt{75.47\text{J} - \left(\sqrt{20\text{J} \cdot 27\text{J}} \right)}$$

9) Pauling's Electronegativity given Effective Nuclear Charge and Covalent Radius 

$$\text{fx } X_P = \left(\frac{0.359 \cdot Z}{r_{\text{covalent}}^2} \right) + 0.744$$

Open Calculator 


$$\text{ex } 7.189705\text{J} = \left(\frac{0.359 \cdot 25}{(1.18\text{A})^2} \right) + 0.744$$

10) Pauling's Electronegativity given IE and EA 

$$\text{fx } X_P = \left(\left(\frac{0.336}{0.5} \right) \cdot (IE + E.A) \right) - 0.2$$

Open Calculator 

$$\text{ex } 29.5696\text{J} = \left(\left(\frac{0.336}{0.5} \right) \cdot (27.2\text{J} + 17.1\text{J}) \right) - 0.2$$

11) Pauling's Electronegativity given Individual Electronegativities 

$$\text{fx } X = |X_A - X_B|$$

Open Calculator 

$$\text{ex } 0.2\text{J} = |3.6\text{J} - 3.8\text{J}|$$





Variables Used

- $E_{(A-B)}$ Actual Bond Energy given Electronegativity (Joule)
- E_{A-A} Bond Energy of A_2 Molecule (Joule)
- E_{B-B} Bond Energy of B_2 Molecule (Joule)
- $E.A$ Electron Affinity (Joule)
- IE Ionization Energy (Joule)
- r_{covalent} Covalent Radius (Angstrom)
- X X_p given Individual Electronegativities (Joule)
- X_A Electronegativity of Element A (Joule)
- $X_{A.R}$ Allred-Rochow's Electronegativity (Joule)
- X_B Electronegativity of Element B (Joule)
- X_M Mulliken's Electronegativity (Joule)
- X_p Pauling's Electronegativity given I.E and E.A (Joule)
- X_P Pauling's Electronegativity (Joule)
- Z Effective Nuclear Charge
- Δ_p Covalent Ionic Resonance Energy for X_p (Joule)






Constants, Functions, Measurements used

- **Function:** **abs**, abs(Number)
Absolut value function
- **Function:** **sqrt**, sqrt(Number)
Square root function
- **Measurement:** **Length** in Angstrom (A)
Length Unit Conversion 
- **Measurement:** **Energy** in Joule (J)
Energy Unit Conversion 



Check other formula lists

- [Allred Rochow's Electronegativity Formulas](#) 
- [Pauling's Electronegativity Formulas](#) 
- [Mulliken's Electronegativity Formulas](#) 

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