calculatoratoz.com

unitsconverters.com

Electronic Spectroscopy 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 15 Electronic Spectroscopy Formulas

Electronic Spectroscopy

1) Angular Wavenumber

Open Calculator

fx $$k = \frac{2 \cdot \pi}{\lambda_{wave}}$$

ex $$0.634665m = \frac{2 \cdot \pi}{9.9m}$$

2) Binding Energy of Photoelectron

Open Calculator

fx $$E_{binding} = ([hP] \cdot \nu) - E_{kinetic} - \Phi$$

ex $$5.12607N*m = ([hP] \cdot 1E\hat{}34Hz) - 6.6E\hat{}\text{-}19J - 1.5J$$

3) Coherence Length of Wave

Open Calculator

fx $$l_C = \frac{(\lambda_{wave})^2}{2 \cdot \Delta\lambda}$$

ex $$4.08375m = \frac{(9.9m)^2}{2 \cdot 12m}$$

4) Eigenvalue of Energy given Angular Momentum Quantum Number

Open Calculator

$$\mathrm{E} = \frac{\mathrm{l} \cdot (\mathrm{l}+1) \cdot ([\mathrm{hP}])^2}{2 \cdot \mathrm{I}}$$

$$7.2\mathrm{E\hat{}\text{-}63J} = \frac{1.9 \cdot (1.9+1) \cdot ([\mathrm{hP}])^2}{2 \cdot 0.000168\mathrm{kg \cdot m^2}}$$

5) Energy of Higher State

Open Calculator

$$\mathrm{E_m} = (\nu_{\mathrm{mn}} \cdot [\mathrm{hP}]) + \mathrm{E_n}$$

$$8.3\mathrm{E\hat{}\text{-}33J} = (5\mathrm{Hz} \cdot [\mathrm{hP}]) + 5\mathrm{E\hat{}\text{-}33J}$$

6) Energy of Lower State

Open Calculator

$$\mathrm{E_n} = (\nu_{\mathrm{mn}} \cdot [\mathrm{hP}]) + \mathrm{E_m}$$

$$1.1\mathrm{E\hat{}\text{-}32J} = (5\mathrm{Hz} \cdot [\mathrm{hP}]) + 8\mathrm{E\hat{}\text{-}33J}$$

7) Frequency of Absorbed Radiation

Open Calculator

$$\nu_{\mathrm{mn}} = \frac{\mathrm{E_m} - \mathrm{E_n}}{[\mathrm{hP}]}$$

$$4.527571\mathrm{Hz} = \frac{8\mathrm{E\hat{}\text{-}33J} - 5\mathrm{E\hat{}\text{-}33J}}{[\mathrm{hP}]}$$

8) Kinetic Energy of Photoelectron

Open Calculator

$$\mathrm{E_{kinetic}} = ([\mathrm{hP}] \cdot \nu) - \mathrm{E_{binding}} - \Phi$$

$$0.02607\mathrm{J} = ([\mathrm{hP}] \cdot 1\mathrm{E\hat{}34Hz}) - 5.1\mathrm{N*m} - 1.5\mathrm{J}$$

9) Moment of Inertia given Eigen Value of Energy

Open Calculator

$$\mathrm{I} = \frac{\mathrm{l} \cdot (\mathrm{l}+1) \cdot ([\mathrm{hP}])^2}{2 \cdot \mathrm{E}}$$

$$0.000173\mathrm{kg{\cdot}m^2} = \frac{1.9 \cdot (1.9+1) \cdot ([\mathrm{hP}])^2}{2 \cdot 7\mathrm{E\hat{}\text{-}63J}}$$

10) Range of Wavelength

Open Calculator

$$\Delta\lambda = \frac{(\lambda_{\mathrm{wave}})^2}{2 \cdot \mathrm{l_C}}$$

$$12.2207\mathrm{m} = \frac{(9.9\mathrm{m})^2}{2 \cdot 4.01\mathrm{m}}$$

11) Rydberg Constant given Compton Wavelength

Open Calculator

$$\mathrm{R} = \frac{(\alpha)^2}{2 \cdot \lambda_{\mathrm{c}}}$$

$$1.1\mathrm{E\hat{}\text{-}7cm^{-1}} = \frac{(7.297\mathrm{E\hat{}\text{-}3})^2}{2 \cdot 2.42\mathrm{m}}$$

12) Spectroscopic Wave Number

Open Calculator

fx $$\bar{\nu} = \frac{1}{\lambda_{\text{lightwave}}}$$

ex $$0.000476\text{cm}^{-1} = \frac{1}{21\text{m}}$$

13) Wavelength given Angular Wave Number

Open Calculator

fx $$\lambda_{\text{wave}} = \frac{2 \cdot \pi}{k}$$

ex $$9.97331\text{m} = \frac{2 \cdot \pi}{0.63\text{m}}$$

14) Wavelength given Spectroscopic Wave Number

Open Calculator

fx $$\lambda_{\text{lightwave}} = \frac{1}{\bar{\nu}}$$

ex $$20\text{m} = \frac{1}{0.0005\text{cm}^{-1}}$$

15) Work Function

Open Calculator

fx $$\Phi = ([\text{hP}] \cdot \nu) - E_{\text{binding}} - E_{\text{kinetic}}$$

ex $$1.52607\text{J} = ([\text{hP}] \cdot 1\text{E\^{}}34\text{Hz}) - 5.1\text{N*m} - 6.6\text{E\^{}-19J}$$

Variables Used

- E Eigenvalue of Energy *(Joule)*
- $E_{binding}$ Binding Energy of Photoelectron *(Newton Meter)*
- $E_{kinetic}$ Kinetic Energy of Photoelectron *(Joule)*
- E_m Energy of Higher State *(Joule)*
- E_n Energy of Lower State *(Joule)*
- I Moment of Inertia *(Kilogram Square Meter)*
- k Angular Wavenumber *(Meter)*
- l Angular Momentum Quantum Number
- l_C Coherence Length *(Meter)*
- R Rydberg Constant *(1 per Centimeter)*
- $\bar{\nu}$ Spectroscopic Wavenumber *(1 per Centimeter)*
- α Fine-Structure Constant
- $\Delta\lambda$ Range of Wavelengths *(Meter)*
- λ_c Compton Wavelength *(Meter)*
- $\lambda_{lightwave}$ Wavelength of Light Wave *(Meter)*
- λ_{wave} Wavelength of Wave *(Meter)*
- ν Photon Frequency *(Hertz)*
- ν_{mn} Frequency of Absorbed Radiation *(Hertz)*
- Φ Work Function *(Joule)*

Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant
- Constant: **[hP]**, 6.626070040E-34 Kilogram Meter² / Second
  Planck constant
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Energy** in Joule (J)
  Energy Unit Conversion
- Measurement: **Frequency** in Hertz (Hz)
  Frequency Unit Conversion
- Measurement: **Wavelength** in Meter (m)
  Wavelength Unit Conversion
- Measurement: **Torque** in Newton Meter (N*m)
  Torque Unit Conversion
- Measurement: **Moment of Inertia** in Kilogram Square Meter (kg·m²)
  Moment of Inertia Unit Conversion
- Measurement: **Reciprocal Length** in 1 per Centimeter (cm^{-1})
  Reciprocal Length Unit Conversion

Check other formula lists

- **Electronic Spectroscopy Formulas**
- **Nuclear Magnetic Resonance Spectroscopy Formulas**
- **Raman Spectroscopy Formulas**
- **Vibrational spectroscopy Formulas**

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

6/7/2023 | 3:38:47 AM UTC

Please leave your feedback here...