Important Spectrometric Characterization of Polymers Formulas PDF

Formulas
Examples
with Units

List of 9
Important Spectrometric Characterization of Polymers Formulas

1) Binding Energy given Work Function Formula

Evaluate Formula

Formula

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

Example with Units

$$14.4\,\text{N*m} = (6.6\text{E-}34 \cdot 2.4\text{E+}34\,\text{Hz}) - 0.0026\,\text{J} - 1.5\,\text{J}$$

2) Change in Temperature given Thermal Conductivity Formula

Evaluate Formula

Formula

$$\Delta T = \frac{Q \cdot L}{A_{sample} \cdot k}$$

Example with Units

$$4.9023\,\text{K} = \frac{125\,\text{W} \cdot 21\,\text{m}}{52.6\,\text{m}^2 \cdot 10.18\,\text{W/(m*K)}}$$

3) Density given Thermal Diffusivity Formula

Evaluate Formula

Formula

$$\rho = \frac{k}{\alpha \cdot c}$$

Example with Units

$$0.0002\,\text{kg/m}^3 = \frac{10.18\,\text{W/(m*K)}}{16\,\text{m}^2\text{/s} \cdot 4.184\,\text{kJ/kg*K}}$$

4) Energy of Auger Electron Formula

Evaluate Formula

Formula

$$E_A = E_{o1} - E_i + E_{o2}$$

Example with Units

$$12.99\,\text{V} = 15\,\text{V} - 5.01\,\text{V} + 3\,\text{V}$$

5) Heat of Polymerization Formula

Evaluate Formula

Formula

$$\Delta H_p = E_p - E_{dp}$$

Example with Units

$$20.55\,\text{KJ/mol} = 26.2\,\text{KJ/mol} - 5.65\,\text{KJ/mol}$$

6) Kinetic Energy given Binding Energy Formula

Evaluate Formula

Formula

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

Example with Units

$$0.0026\,J = (6.6E\text{-}34 \cdot 2.4E{+}34\,Hz) - 14.4\,N{*}m - 1.5\,J$$

7) Mobility given Conductivity Formula

Evaluate Formula

Formula

$$\mu_e = \frac{\sigma}{e^- \cdot [Charge\text{-}e]}$$

Example with Units

$$1E{+}17\,m^2/V{*}s = \frac{0.1\,S/m}{6 \cdot 1.6E\text{-}19\,C}$$

8) Specific Heat Capacity given Thermal Diffusivity Formula

Evaluate Formula

Formula

$$c = \frac{k}{\alpha \cdot \rho}$$

Example with Units

$$4.2417\,kJ/kg{*}K = \frac{10.18\,W/(m{*}K)}{16\,m^2/s \cdot 0.00015\,kg/m^3}$$

9) Thermal Conductivity given Heat Flow Rate Formula

Evaluate Formula

Formula

$$k = \frac{Q \cdot L}{A_{sample} \cdot \Delta T}$$

Example with Units

$$10.1847\,W/(m{*}K) = \frac{125\,W \cdot 21\,m}{52.6\,m^2 \cdot 4.9\,K}$$

Variables used in list of Spectrometric Characterization of Polymers Formulas above

- ΔT Change in Temperature *(Kelvin)*
- A_{sample} Sample Area *(Square Meter)*
- **c** Specific Heat Capacity *(Kilojoule per Kilogram per K)*
- E_A Energy of Auger Electron *(Volt)*
- $E_{binding}$ Binding Energy of Photoelectron *(Newton Meter)*
- E_{dp} Activation Energy for Depolymerization *(KiloJoule Per Mole)*
- E_i Energy of Inner Shell Electron *(Volt)*
- $E_{kinetic}$ Kinetic Energy of Photoelectron *(Joule)*
- E_{o1} Energy of Outer Shell Electron *(Volt)*
- E_{o2} Energy of Second Outer Shell Electron *(Volt)*
- E_p Activation Energy for Propagation *(KiloJoule Per Mole)*
- e^- Number of Electrons
- **k** Thermal Conductivity *(Watt per Meter per K)*
- **L** Thickness of Sample *(Meter)*
- **Q** Heat Flow Rate *(Watt)*
- **v** Frequency of Light *(Hertz)*
- **α** Thermal Diffusivity *(Square Meter Per Second)*
- ΔH_p Heat of Polymerization *(KiloJoule Per Mole)*
- μ_e Mobility of Electron *(Square Meter per Volt per Second)*
- **ρ** Density *(Kilogram per Cubic Meter)*
- **σ** Conductivity *(Siemens per Meter)*
- **Φ** Work Function *(Joule)*

Constants, Functions, Measurements used in list of Spectrometric Characterization of Polymers Formulas above

- constant(s): **[Charge-e]**, 1.60217662E-19
  Charge of electron
- constant(s): **[hP]**, 6.626070040E-34
  Planck constant
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Temperature** in Kelvin (K)
  Temperature Unit Conversion
- Measurement: **Area** in Square Meter (m²)
  Area Unit Conversion
- Measurement: **Energy** in Joule (J)
  Energy Unit Conversion
- Measurement: **Power** in Watt (W)
  Power Unit Conversion
- Measurement: **Frequency** in Hertz (Hz)
  Frequency Unit Conversion
- Measurement: **Thermal Conductivity** in Watt per Meter per K (W/(m*K))
  Thermal Conductivity Unit Conversion
- Measurement: **Electric Potential** in Volt (V)
  Electric Potential Unit Conversion
- Measurement: **Specific Heat Capacity** in Kilojoule per Kilogram per K (kJ/kg*K)
  Specific Heat Capacity Unit Conversion
- Measurement: **Electric Conductivity** in Siemens per Meter (S/m)
  Electric Conductivity Unit Conversion
- Measurement: **Density** in Kilogram per Cubic Meter (kg/m³)
  Density Unit Conversion
- Measurement: **Torque** in Newton Meter (N*m)
  Torque Unit Conversion
- Measurement: **Diffusivity** in Square Meter Per Second (m²/s)
  Diffusivity Unit Conversion
- Measurement: **Energy Per Mole** in KiloJoule Per Mole (KJ/mol)
  Energy Per Mole Unit Conversion

- Measurement: **Mobility** in Square Meter per Volt per Second (m²/V*s)
  Mobility Unit Conversion

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