|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  | **Introduction to Spectroscopy** | Name |  | |
|  |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | |
|  |
| **Part I – Hydrogen Energy levels** |
|  |
| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | n | n2 |  |  |  | n | n2 |  |  | | 1 | 1 | **13.6 eV** | **-13.6 eV** |  | 4 |  |  |  | | 2 | 4 | **3.4 eV** | **-3.4 eV** |  | 5 |  |  |  | | 3 |  |  |  |  | 6 |  |  |  | |
|  |
|  |
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|  |
| Part II – Wavelengths and Colors of Photons |
|  |
| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Name | Initial  Orbit | Final  Orbit |  | **(eV)** |  | **(nm)** | Color of  Photon | | Lyman | 2 | 1 |  | **10.2** |  | **122** | **UV** | | Series | 3 | 1 |  |  |  |  |  | |  | 4 | 1 |  |  |  |  |  | |  | 5 | 1 |  |  |  |  |  | |  | 6 | 1 |  |  |  |  |  | | Balmer | 3 | 2 |  | **1.89** |  | **656** | **red** | | Series | 4 | 2 |  |  |  |  |  | |  | 5 | 2 |  |  |  |  |  | |  | 6 | 2 |  |  |  |  |  | | Paschen | 4 | 3 |  |  |  |  |  | | Series | 5 | 3 |  |  |  |  |  | |  | 6 | 3 |  |  |  |  |  | |
|  |
| Part III Spectra |
| **Hydrogen Calculated** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | | **656** | |  | |  | |  | |  | | |  | | --- | | **Color** | | **Red** | |  | |  | |  | |  | | |
|  |
| **Hydrogen Experimental** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Helium** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
|  |
| **Mercury** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
|  |
|  |
| **Incandescent Light or Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Sun or Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
|  |
| **Fluorescent Light or Element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **UV Violet Blue Green Yellow Orange Red IR** | |  | | Wavelength (nm) | | |  | | --- | | **Wavelength**  **(nm)** | |  | |  | |  | |  | |  | | |  | | --- | | **Color** | |  | |  | |  | |  | |  | | |
| **Most Prominent Element Present? ­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |