Elements

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mass (amu) | 1.01 |  | Mass (amu) | 9.01 |  | Mass (amu) | 24.31 |  | Mass (amu) | 39.10 |
| Protons | 1 |  | Protons | 4 |  | Protons | 12 |  | Protons | 19 |
| Neutrons | 1 |  | Neutrons | 4 |  | Neutrons | 12 |  | Neutrons | 19 |
| Electrons | 1 |  | Electrons | 4 |  | Electrons | 12 |  | Electrons | 19 |
| Valence electrons | 1 |  | Valence electrons | 2 |  | Valence electrons | 2 |  | Valence electrons | 1 |
| Energy levels | 1 |  | Energy levels | 2 |  | Energy levels | 3 |  | Energy levels | 4 |
| Characteristics | |  | Characteristics | |  | Characteristics | |  | Characteristics | |
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|  |  |  |  |  |  |  |  |  |  |  |
| Mass (amu) | 26.98 |  | Mass (amu) | 12.01 |  | Mass (amu) | 14.01 |  | Mass (amu) | 74.92 |
| Protons | 13 |  | Protons | 6 |  | Protons | 7 |  | Protons | 33 |
| Neutrons | 13 |  | Neutrons | 6 |  | Neutrons | 7 |  | Neutrons | 33 |
| Electrons | 13 |  | Electrons | 6 |  | Electrons | 7 |  | Electrons | 33 |
| Valence electrons | 3 |  | Valence electrons | 4 |  | Valence electrons | 5 |  | Valence electrons | 5 |
| Energy levels | 3 |  | Energy levels | 2 |  | Energy levels | 2 |  | Energy levels | 4 |
| Characteristics | |  | Characteristics | |  | Characteristics | |  | Characteristics | |
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|  |  |  |  |  |  |  |  |  |  |  |
| Mass (amu) | 35.45 |  | Mass (amu) | 79.90 |  | Mass (amu) | 83.80 |  | Mass (amu) | 4.00 |
| Protons | 17 |  | Protons | 35 |  | Protons | 36 |  | Protons | 2 |
| Neutrons | 17 |  | Neutrons | 35 |  | Neutrons | 36 |  | Neutrons | 2 |
| Electrons | 17 |  | Electrons | 35 |  | Electrons | 36 |  | Electrons | 2 |
| Valence electrons | 7 |  | Valence electrons | 7 |  | Valence electrons | 8 |  | Valence electrons | 2 |
| Energy levels | 3 |  | Energy levels | 4 |  | Energy levels | 4 |  | Energy levels | 1 |
| Characteristics | |  | Characteristics | |  | Characteristics | |  | Characteristics | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mass (amu) | 1.01 |  | Mass (amu) | 9.01 |  | Mass (amu) | 24.31 |  | Mass (amu) | 39.10 |
| Protons | 1 |  | Protons | 4 |  | Protons | 12 |  | Protons | 19 |
| Neutrons | 1 |  | Neutrons | 4 |  | Neutrons | 12 |  | Neutrons | 19 |
| Electrons | 0 |  | Electrons | 2 |  | Electrons | 10 |  | Electrons | 18 |
| Valence electrons | 0 |  | Valence electrons | 2 |  | Valence electrons | 8 |  | Valence electrons | 8 |
| Energy levels | 0 |  | Energy levels | 1 |  | Energy levels | 2 |  | Energy levels | 3 |
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|  |  |  |  |  |  |  |  |  |  |  |
| Mass (amu) | 26.98 |  | Mass (amu) | 12.01 |  | Mass (amu) | 14.01 |  | Mass (amu) | 74.92 |
| Protons | 13 |  | Protons | 6 |  | Protons | 7 |  | Protons | 33 |
| Neutrons | 13 |  | Neutrons | 6 |  | Neutrons | 7 |  | Neutrons | 33 |
| Electrons | 10 |  | Electrons | 2 |  | Electrons | 10 |  | Electrons | 36 |
| Valence electrons | 8 |  | Valence electrons | 2 |  | Valence electrons | 8 |  | Valence electrons | 8 |
| Energy levels | 2 |  | Energy levels | 1 |  | Energy levels | 2 |  | Energy levels | 4 |
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|  |  |  |  |  |  |  |  |  |  |  |
| Mass (amu) | 35.45 |  | Mass (amu) | 79.90 |  | Mass (amu) | 83.80 |  | Mass (amu) | 4.00 |
| Protons | 17 |  | Protons | 35 |  | Protons | 36 |  | Protons | 2 |
| Neutrons | 17 |  | Neutrons | 35 |  | Neutrons | 36 |  | Neutrons | 2 |
| Electrons | 18 |  | Electrons | 36 |  | Electrons | 36 |  | Electrons | 2 |
| Valence electrons | 8 |  | Valence electrons | 8 |  | Valence electrons | 8 |  | Valence electrons | 2 |
| Energy levels | 3 |  | Energy levels | 4 |  | Energy levels | 4 |  | Energy levels | 1 |

Ions

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mass (amu) | 1.01 |  | Mass (amu) | 9.01 |  | Mass (amu) | 25.98 |  | Mass (amu) | 38.96 |
| Protons | 1 |  | Protons | 4 |  | Protons | 12 |  | Protons | 19 |
| Neutrons | 0 |  | Neutrons | 5 |  | Neutrons | 14 |  | Neutrons | 20 |
| Electrons | 1 |  | Electrons | 4 |  | Electrons | 12 |  | Electrons | 19 |
| Valence electrons | 1 |  | Valence electrons | 2 |  | Valence electrons | 2 |  | Valence electrons | 1 |
| Energy levels | 1 |  | Energy levels | 2 |  | Energy levels | 3 |  | Energy levels | 4 |
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|  |  |  |  |  |  |  |  |  |  |  |
| Mass (amu) | 26.98 |  | Mass (amu) | 13.00 |  | Mass (amu) | 14.00 |  | Mass (amu) | 79.92 |
| Protons | 13 |  | Protons | 6 |  | Protons | 7 |  | Protons | 33 |
| Neutrons | 14 |  | Neutrons | 7 |  | Neutrons | 7 |  | Neutrons | 40 |
| Electrons | 13 |  | Electrons | 6 |  | Electrons | 7 |  | Electrons | 33 |
| Valence electrons | 3 |  | Valence electrons | 4 |  | Valence electrons | 5 |  | Valence electrons | 5 |
| Energy levels | 3 |  | Energy levels | 2 |  | Energy levels | 2 |  | Energy levels | 4 |
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| Mass (amu) | 34.97 |  | Mass (amu) | 78.92 |  | Mass (amu) | 83.91 |  | Mass (amu) | 3.02 |
| Protons | 17 |  | Protons | 35 |  | Protons | 36 |  | Protons | 2 |
| Neutrons | 18 |  | Neutrons | 44 |  | Neutrons | 48 |  | Neutrons | 1 |
| Electrons | 17 |  | Electrons | 35 |  | Electrons | 36 |  | Electrons | 2 |
| Valence electrons | 7 |  | Valence electrons | 7 |  | Valence electrons | 8 |  | Valence electrons | 2 |
| Energy levels | 3 |  | Energy levels | 4 |  | Energy levels | 4 |  | Energy levels | 1 |

Isotopes

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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |

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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |

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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |

Ions

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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |
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| Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |  | Mass (amu) |  |
| Protons |  |  | Protons |  |  | Protons |  |  | Protons |  |
| Neutrons |  |  | Neutrons |  |  | Neutrons |  |  | Neutrons |  |
| Electrons |  |  | Electrons |  |  | Electrons |  |  | Electrons |  |
| Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |  | Valence electrons |  |
| Energy levels |  |  | Energy levels |  |  | Energy levels |  |  | Energy levels |  |

Isotopes