Periodic Trends

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1. **Atomic Radius**:
    - Decreases across a period due to increasing nuclear charge pulling electrons closer.
    - Increases down a group as new energy levels are added, increasing the distance between the nucleus and outer electrons.
2. **Ionization Energy**:
    - Increases across a period due to stronger nuclear charge holding electrons more tightly.
    - Decreases down a group as electrons are further from the nucleus and experience less attraction.
3. **Electron Affinity**:
    - Increases across a period as atoms have a greater affinity to gain an electron to achieve a stable electron configuration.
    - Decreases down a group due to increased atomic size and shielding effect.
4. **Electronegativity**:
    - Increases across a period as atoms have a stronger attraction for electrons.
    - Decreases down a group due to larger atomic size and increased distance between nucleus and valence electrons.
5. **Metallic Character**:
    - Decreases across a period as elements become less metallic and more non-metallic.
    - Increases down a group as elements become more metallic and less non-metallic.
6. **Shielding Effect**:
    - Increases down a group as additional energy levels shield outer electrons from the attractive force of the nucleus.
    - Remains relatively constant across a period as the number of shielding electrons stays the same.

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Understanding these periodic trends can help predict the properties of elements and their compounds, providing valuable insights into their behavior and reactivity.