

Explain the variation in ionization energy across the elements of period 2 in the periodic table.

As you go across the period from one element to the next, the positive nuclear charge is increasing by one unit as the atomic/proton number increases by one unit and the charge is acting on electrons in the same principal quantum level. The effective nuclear charge can be considered to be equal to the number of outer electrons (this is very approximate and NOT a rule) and this is increasing from left to right as no new quantum shell is added i.e. no extra shielding. Therefore the outer electron is increasingly more strongly held by the increasing positive charge of the nucleus and so, increasingly, more energy is needed to remove it. So, for Period 2, the Group 1 Alkali Metal (lithium, lowest Z) has the lowest 1st ionisation energy and the Group 0/18 Noble Gas (neon, highest Z) has the highest 1st ionisation energy value and most values follow the general trend of increasing from left to right across period 2.

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