**Successive Ionization Energies**

1. The following tables contain ionization energies (IE in eV) for one element. Which group on the periodic table would have this trend and what are the possible elements?

|  |  |
| --- | --- |
| IE1 | 6.11 |
| IE2 | 11.87 |
| IE3 | 50.91 |
| IE4 | 67.27 |
| IE5 | 84.50 |
| IE6 | 108.8 |
| IE7 | 127.2 |
| IE8 | 147.2 |

|  |  |
| --- | --- |
| IE1 | 13.6 |
| IE2 | 35.12 |
| IE3 | 54.93 |
| IE4 | 77.41 |
| IE5 | 113.9 |
| IE6 | 138.1 |
| IE7 | 739.3 |
| IE8 | 871.4 |

|  |  |
| --- | --- |
| IE1 | 21.56 |
| IE2 | 40.96 |
| IE3 | 63.44 |
| IE4 | 97.12 |
| IE5 | 126.2 |
| IE6 | 157.9 |
| IE7 | 207.3 |
| IE8 | 239.1 |

**Successive Ionization Energies**

1. The following tables contain ionization energies (IE in eV) for one element. Which group on the periodic table would have this trend and what are the possible elements?
   1. Ca

|  |  |
| --- | --- |
| IE1 | 6.11  2 valence electrons |
| IE2 | 11.87  requires more energy to remove an electron from a full outer shell - big jump (isoelectronic to a Noble gas) |
| IE3 | 50.91 |
| IE4 | 67.27 |
| IE5 | 84.50 |
| IE6 | 108.8 |
| IE7 | 127.2 |
| IE8 | 147.2 |

Group 2 has 2 valance electrons – this cannot be Be because Be can only lose 4 electrons and there is 8 IE values.

* 1. O

|  |  |
| --- | --- |
| IE1 | 13.6 |
| IE2 | 35.12  6 valence electrons |
| IE3 | 54.93 |
| IE4 | 77.41 |
| IE5 | 113.9 |
| IE6 | 138.1  Removing an electron from a full outer shell |
| IE7 | 739.3 |
| IE8 | 871.4 |

Group 16 has 6 valance electrons – this could be any element from that group

* 1. Ne

|  |  |
| --- | --- |
| IE1 | 21.56  No big jump 🡪 a noble gas  These values could not be He as He can only lose 2 electrons |
| IE2 | 40.96 |
| IE3 | 63.44 |
| IE4 | 97.12 |
| IE5 | 126.2 |
| IE6 | 157.9 |
| IE7 | 207.3 |
| IE8 | 239.1 |