

# THE PERIODIC TABLE OF THE ELEMENTS

Handwritten circled 'S' with an arrow pointing to the first column.

|               |               |
|---------------|---------------|
| 1<br>1A<br>1A | 2<br>2A<br>2A |
| 3<br>3A<br>3A | 4<br>4A<br>4A |
| 5<br>5A<br>5A | 6<br>6A<br>6A |
| 7<br>7A<br>7A | 8<br>8A<br>8A |

Handwritten 'p-block' with arrows pointing to the last six columns.

Handwritten 'd-block' with a bracket under the transition metal block.

|          |          |                            |           |           |           |           |           |           |           |           |           |            |           |            |           |            |            |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|-----------|------------|-----------|------------|------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1<br>H   | 2<br>Li  | 3<br>Be                    | 4<br>Na   | 5<br>Mg   | 6<br>Al   | 7<br>Si   | 8<br>P    | 9<br>S    | 10<br>Cl  | 11<br>Ar  | 12<br>K   | 13<br>Ca   | 14<br>Sc  | 15<br>Ti   | 16<br>V   | 17<br>Cr   | 18<br>Mn   | 19<br>Fe | 20<br>Co | 21<br>Ni | 22<br>Cu | 23<br>Zn | 24<br>Ga | 25<br>Ge | 26<br>As | 27<br>Se | 28<br>Br | 29<br>Kr |
| 31<br>Rb | 32<br>Sr | 33<br>Y                    | 34<br>Zr  | 35<br>Nb  | 36<br>Mo  | 37<br>Tc  | 38<br>Ru  | 39<br>Rh  | 40<br>Pd  | 41<br>Ag  | 42<br>Cd  | 43<br>In   | 44<br>Sn  | 45<br>Sb   | 46<br>Te  | 47<br>I    | 48<br>Xe   |          |          |          |          |          |          |          |          |          |          |          |
| 55<br>Cs | 56<br>Ba | 57-71<br>Lanthanide Series | 72<br>Hf  | 73<br>Ta  | 74<br>W   | 75<br>Re  | 76<br>Os  | 77<br>Ir  | 78<br>Pt  | 79<br>Au  | 80<br>Hg  | 81<br>Tl   | 82<br>Pb  | 83<br>Bi   | 84<br>Po  | 85<br>At   | 86<br>Rn   |          |          |          |          |          |          |          |          |          |          |          |
| 87<br>Fr | 88<br>Ra | 89-103<br>Actinide Series  | 104<br>Rf | 105<br>Db | 106<br>Sg | 107<br>Bh | 108<br>Hs | 109<br>Mt | 110<br>Ds | 111<br>Rg | 112<br>Cn | 113<br>Uut | 114<br>Fl | 115<br>Uup | 116<br>Lv | 117<br>Uus | 118<br>Uuo |          |          |          |          |          |          |          |          |          |          |          |

Handwritten 'f-block' with a bracket pointing to the Lanthanide and Actinide series.

|          |          |          |          |          |          |          |          |          |          |          |           |           |           |           |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| 57<br>La | 58<br>Ce | 59<br>Pr | 60<br>Nd | 61<br>Pm | 62<br>Sm | 63<br>Eu | 64<br>Gd | 65<br>Tb | 66<br>Dy | 67<br>Ho | 68<br>Er  | 69<br>Tm  | 70<br>Yb  | 71<br>Lu  |
| 89<br>Ac | 90<br>Th | 91<br>Pa | 92<br>U  | 93<br>Np | 94<br>Pu | 95<br>Am | 96<br>Cm | 97<br>Bk | 98<br>Cf | 99<br>Es | 100<br>Fm | 101<br>Md | 102<br>No | 103<br>Lr |

- Alkali Metal
- Alkaline Earth
- Transition Metal
- Basic Metal
- Semi-metal
- Nonmetal
- Halogen
- Noble Gas
- Lanthanide
- Actinide

| 13                      | 14                      | 15                      | 16                      | 17                      | 18                      |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 5<br>B<br>$2s^2 2p^1$   | 6<br>C<br>$2s^2 2p^2$   | 7<br>N<br>$2s^2 2p^3$   | 8<br>O<br>$2s^2 2p^4$   | 9<br>F<br>$2s^2 2p^5$   | 10<br>Ne<br>$2s^2 2p^6$ |
| 13<br>Al<br>$3s^2 3p^1$ | 14<br>Si<br>$3s^2 3p^2$ | 15<br>P<br>$3s^2 3p^3$  | 16<br>S<br>$3s^2 3p^4$  | 17<br>Cl<br>$3s^2 3p^5$ | 18<br>Ar<br>$3s^2 3p^6$ |
| 31<br>Ga<br>$4s^2 4p^1$ | 32<br>Ge<br>$4s^2 4p^2$ | 33<br>As<br>$4s^2 4p^3$ | 34<br>Se<br>$4s^2 4p^4$ | 35<br>Br<br>$4s^2 4p^5$ | 36<br>Kr<br>$4s^2 4p^6$ |
| 49<br>In<br>$5s^2 5p^1$ | 50<br>Sn<br>$5s^2 5p^2$ | 51<br>Sb<br>$5s^2 5p^3$ | 52<br>Te<br>$5s^2 5p^4$ | 53<br>I<br>$5s^2 5p^5$  | 54<br>Xe<br>$5s^2 5p^6$ |
| 81<br>Tl<br>$6s^2 6p^1$ | 82<br>Pb<br>$6s^2 6p^2$ | 83<br>Bi<br>$6s^2 6p^3$ | 84<br>Po<br>$6s^2 6p^4$ | 85<br>At<br>$6s^2 6p^5$ | 86<br>Rn<br>$6s^2 6p^6$ |

 Metals (धातु)

 Non-metals (अधातु)

 Metalloids (अर्धातु)

## वर्ग 15 के तत्वों के सामान्य गुण

नाइट्रोजन ✓

फॉस्फोरस ✓

आर्सेनिक ✓

एंटीमनी ✓

बिस्मथ ✓

अधातु ✓

अधातु ✓

उपधातु ✓

उपधातु ✓

धातु ✓

→ N<sub>2</sub>

→ P<sub>4</sub>

→ As<sub>4</sub>

→ Sb<sub>4</sub>

→ Bi



$$1s^2 \Rightarrow N = 2 \quad 5$$

| परमाणु क्रमांक | प्रतीक | इलेक्ट्रॉनिक विन्यास  | K | L | M  |
|----------------|--------|---|---|---|----|
| 7              | N      | [He] <u>2s<sup>2</sup> 2p<sup>3</sup></u>                                   | 2 | 5 |    |
| 15             | P      | [Ne] <u>3s<sup>2</sup> 3p<sup>3</sup></u>                                   | 2 | 8 | 5  |
| 33             | As     | [Ar] 3d <sup>10</sup> <u>4s<sup>2</sup> 4p<sup>3</sup></u>                  | 2 | 8 | 18 |
| 51             | Sb     | [Kr] 4d <sup>10</sup> <u>5s<sup>2</sup> 5p<sup>3</sup></u>                  | 2 | 8 | 18 |
| 83             | Bi     | [Xe] 4f <sup>14</sup> 5d <sup>10</sup> <u>6s<sup>2</sup> 6p<sup>3</sup></u> |   |   |    |

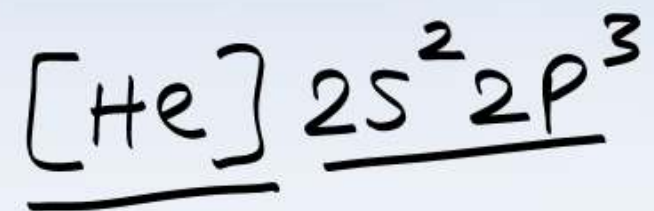
2 8 5  
N 0

5

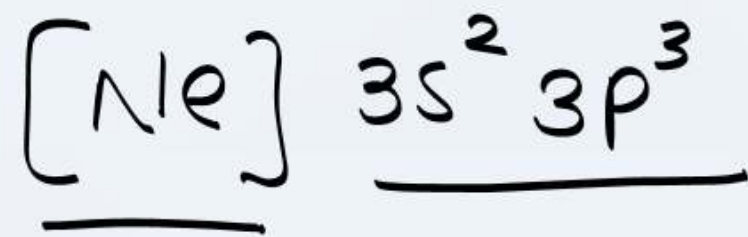
18 5

+8  
+18  
+18  
+32

$$7N = \underline{1s^2} 2s^2 2p^3$$



$$15P = \underline{1s^2 2s^2 2p^6} 3s^2 3p^3$$



परमाणु त्रिज्या

✓ N



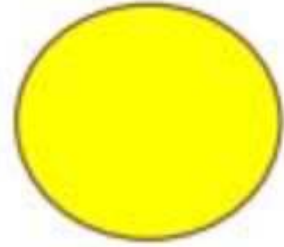
✓ P



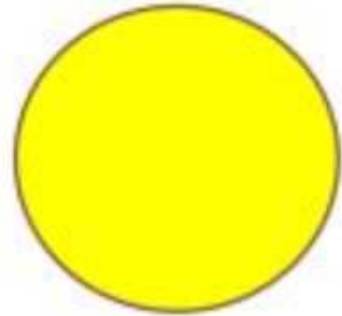
✓ As



✓ Sb



✓ Bi



परमाणु आकार वर्ग  
मे ऊपर से नीचे  
जाने पर बढ़ती है।

# आयनन एंथैल्पी

N

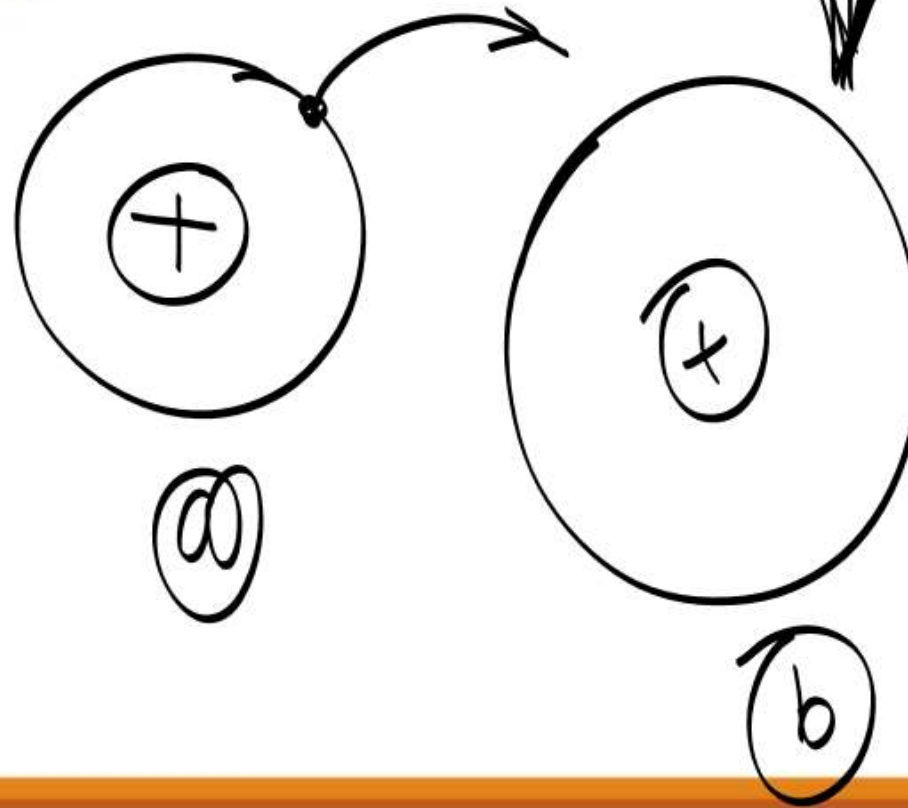
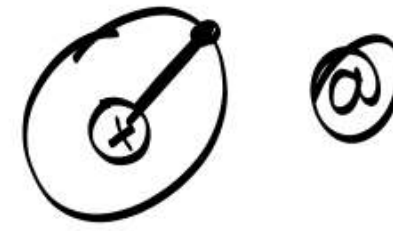
P

As

Sb

Bi

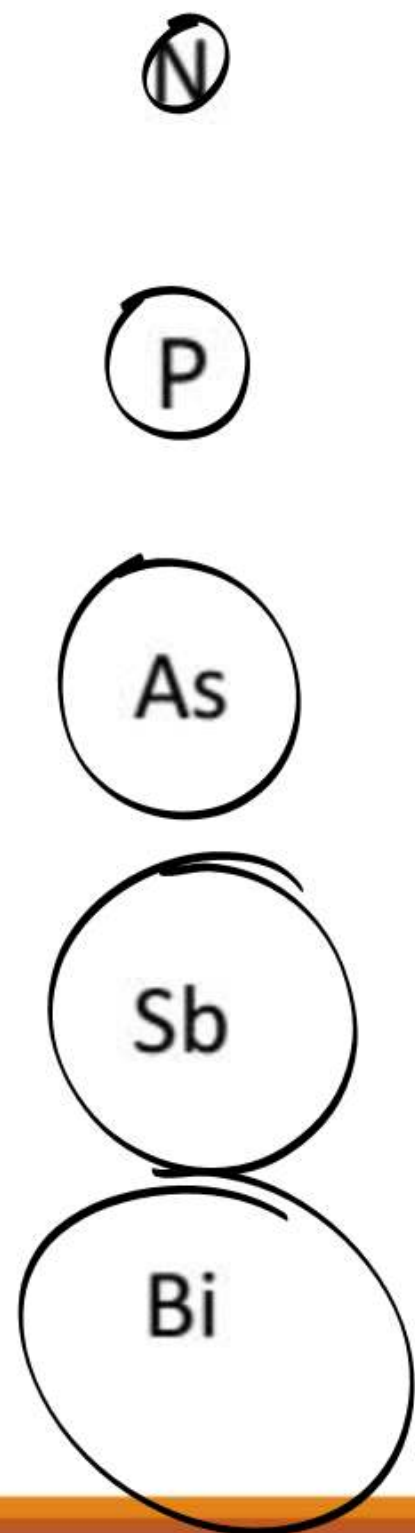
आयनन एंथैल्पी  
वर्ग में ऊपर से नीचे  
जाने पर घटती है।



$$I.E \propto \frac{1}{A.R}$$

$$\text{आयनन एंथैल्पी} \propto \frac{1}{\text{फ. त्रि.}}$$

## विद्युत ऋणात्मकता



विद्युत ऋणात्मकता  
वर्ग में ऊपर से नीचे  
जाने पर घटती है।

$$E.N \propto \frac{1}{A \cdot R}$$

H.W

p-block