

Dobereiner

Principle:

He arranged a group of three elements (called triad) in increasing order of atomic mass. The atomic mass of the middle element was roughly average of other two elements:

Example:

Element	Atomic mass	Element	Atomic mass	Element	Atomic mass
Li	6.9	Ca	40.1	Ce	35.5
Na	23.0	Sr	87.6	Br	79.9
K	39.0	Ba	137.6	I	126.9

$\frac{Li+K}{2} = \frac{6.9+39.0}{2}$	$\frac{Ca+Ba}{2} = \frac{40.1+137.6}{2}$	$\frac{Ce+I}{2} = \frac{(35.5+126.9)}{2}$
$= \frac{45.9}{2}$	$= \frac{177.7}{2}$	$= \frac{162.4}{2}$
$= 22.95$	$= 88.85$	$= 81.2$

Limitation:

He could identify only three triads from the elements known at that time.

Newlands

Principle:

He arranged elements in increasing order of atomic mass and found that every eighth element had properties similar to that of first element. He compared this to the music octaves, thus this is called as 'Newlands law of Octaves'.

sa (do)	re (re)	ga (mi)	ma (fa)	pa (so)	da (la)	ni (ti)
H	Li	Be	B	C	N	O
F	Na	Mg	Al	Si	P	S
Cl	K	Ca	Cr	Ti	Mn	Fe
Co and Ni	Cu	Zn	Y	In	As	Se
Br	Rb	Sr	Ce and La	Zn	-	-

Limitation:

- i) Law of octaves was applicable only upto calcium.
- ii) New elements discovered did not follow the Law of Octaves.
- iii) At few places two elements were placed at same place, example: Co, Ni and Ce, La
- iv) Not so same elements were in same group, example: Co and Cl, Fe and O
- v) At some place like elements were grouped separately, example Fe and Co