

14

C
Si
Ge
Sn
Pb
Uuq

p-BLOCK ELEMENTS

11) GROUP 14

14

C
Si
Ge
Sn
Pb
Uuq

STUDY NOTES

GROUP 14 ELEMENTS

IPE VIEW: [2VSAQ]

Carbon (C), Silicon(Si), Germanium(Ge), Tin(Sn) , Lead (Pb)

GEC: ns^2np^2 ; General oxidation state: -4, +2, +4.

Metallic Character

Top 2 Elements Carbon and silicon are **non-metals**.Middle most element **Germanium** is a **metalloid**.Last 2 Elements **Tin** and **Lead** are **metals**.

Catenation

It is the property of self-linkage among the atoms of the same element to form long chains and rings.

Carbon has very high catenation ability. It is due to its highest C-C bond energy.

Allotropy

It is the existence of an element in two or more physical forms.

Carbon's Allotrope forms:

- (i) **crystalline form** - Diamond, graphite
- (ii) **amorphous form** - Coal, coke, animal charcoal, lamp black.....

Silicon

Silicon is the **second most abundant** element in Earth's crust.Silicon dioxide has a three-dimensional structure. **Silicon dioxide** is called **silica**.Silica occurs in both crystalline form and amorphous form. The **purest** form of **silica** is **Quartz**.**Silicates** are used in building materials.**Ex:** Granites, slate bricks and cement ceramics.**Zeolites:** Replacements of one or two silicon atoms in $[Si_2O_8]^{-2n}$ form Zeolites.

Zeolites act as ion exchangers and molecular sieves.

Fuel: Fuel is a substance which liberates energy when burnt in air.**Producer gas :** Mixture of CO and N_2 **Uses:** Gas engines, manufacture of ammonia, steel, glass.**Water gas /Syngas :** Mixture of CO and H_2 **Uses:** synthesis of methanol and hydro carbons.**Semi water gas:** Mixture of CO, N_2 and H_2 **Gaseous fuels:** Producer gas, water gas and semi water gas

GROUP 14

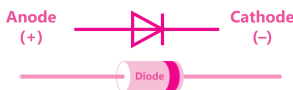
CHEM BEATS!



C-Diamond



Si- CPU



Ge - DIODE



Sn - Can



Pb - Lead Battery

GROUP-14

- C (6) CARBON** [Miss. Organic Queen King] : Hardest Non-metal ; Four Core Organic Friends C, H, O, N.
- Si (14) SILICON** [Mr. & Mrs. Computer] : Hard Semi metal. Silicon chips are used in CPU of computers.
- Ge (32) GERMANIUM** [Mr. & Mrs. Diode] : Brittle Semi Metal used in Diode.
- Sn (50) TIN** [Mr. Tin Can] : Non-corrosive Soft metal used in tin cans. Sn stands for Stanum.
- Pb (82) LEAD** [Mr. Softest] : Softest dense metal used in Acid Battery . Pb stands for Plumbum.