Corrosion

(b) if the suspended particles are chemically inactive in nature *(e.g.,* charcoal), they absorb both sulphur gases, and moisture and slowly enhance corrosion rate.

CORROSION CONTROL:

Following are the methods for control of corrosion :

(i) Suitable designing: The design of the material should be such that corrosion if occurs is uniform and not localized. Following precautions must be taken :

(a) The contact of dissimilar metals in presence of corroding solution is to be avoided.

(b) The anodic material should have as large area as possible when two dissimilar metals are in contact.

(c) When two dissimilar metals in contact have to be used, they should be as close as possible in electrochemical series.

Corrosion

(d) An insulating filling may be used to avoid direct metal-metal electrical contact.

(e) The anodic metal should not be painted or coated because any break in coating would cause rapid localized corrosion.

(f) A suitable design should avoid presence of cracks between adjacent parts of the structure.

(g) Sharp comers are the poor design and should be avoided because they favour accumulation of solids.

(h) The equipment should be supported on legs for free circulation of air.

(i) Uniform flow of corrosive liquid is desirable.

(j) A suitable design should prevent condition subjecting some areas of structure to stress.

Corrosion

(ii) Using pure metal: Impurities in a metal cause heterogeneous state thereby accelerating corrosion rate. Corrosion resistance of a metal may be improved by increasing its purity. Corrosion resistance of a purified metal also depends on the nature of corroding environment.

(iii) Using metal alloys: Corrosion resistance of most metals is increased by alloying them with suitable elements. *e.g.,* Cr is the best suitable alloying metal for iron. Steel containing 13% Cr are used in surgical equipments.

(iv) Cathodic protection: The principle is to force the metal to behave like cathode so that corrosion does not occur. Two types of cathodic protections are possible.

Corrosion

(a) Sacrifical protection: In this method the metal to be protected is connected by a wire to a more anodic metal. The more active metal losses electrons and gets corroded slowly thereby protecting the parent cathodic metal. *e.g.,* Galvanisation process where iron is protected by covering with zinc. Some sacrificial anodes commonly employed are Mg, Zn, Al etc. Applications of this method include underground cables, water tanks etc.

(b) Electrical cathodic protection: In this method an impressed current is applied in opposite direction to nullify the corrosion current and convert the corroding metal from anode to cathode. The current is derived from direct sources like battery of rectifier on A.C. line with an insoluble anode (graphite, platinum).

This technique is used for long term operations.