

Phase Rule- Phase Equilibria

How to calculate number of phases (P):

- i) Mixture of Gas:
- ii) $A + B \rightleftharpoons C$ (P=1)
If vander Waals force $A \gg B$,
 $A + B \rightleftharpoons C$ (P=2)
- iii) Colloidal solution \rightarrow Heterogeneous
P = no. of solute + solvent
- iv) True solution \rightarrow Homogeneous (P=1)
- v) Polar + Polar (P=1)
Eg: $H_2O + C_2H_5OH$
- vi) Non-polar + non-polar (P=1)
Eg: $CCl_4 + C_2H_5-O-C_2H_5$
- vii) Polar + Non-polar \rightarrow Heterogeneous (P = 2)
Eg: $H_2O + CCl_4$
- viii) Gas+ liquid
Eg: $SO_2 + H_2O \rightarrow$ Hetero (P = 2)
If dipole moment of gas increases, solubility increases
Eg: $NH_3 + H_2O$
 $HCl + H_2O$
Both above reactions form homogeneous solution with P = 1
- ix) Saturated solution above saturation \rightarrow hetero (P \neq 1)
Below saturation \rightarrow Homo (P = 1)
- x) Mixture of solids: P= no. of solids
- xi) Alloy: Homo (P = 1)
- xii) Hydrated solution- Each hydrate is a phase
 $CuSO_4 \cdot 5H_2O + CuSO_4 \cdot 3H_2O + CuSO_4 \cdot H_2O \rightarrow$ (P = 3)
