



Differences between Solubility & Dissolution

Solubility	Dissolution
Intrinsic dynamic properties	Extrinsic Kinetic properties
Depends on:	Depends on:
Chemical and physical properties of the solute & solvent	Chemical and physical properties of external phase
pH	Complexation
Temperature	P.S. & S.A.
Pressure	Solubilizing agent

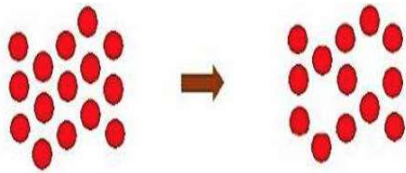


Solubility Expression

Description forms (solubility definition)	Parts of solvent required for one part of solute	Solubility range (mg/ml)	Solubility assigned (mg/ml)
Very soluble (VS)	<1	>1000	1000
Freely soluble (FS)	From 1 to 10	100-1000	100
Soluble	From 10 to 30	33-100	33
Sparingly soluble (SPS)	From 30 to 100	10-33	10
Slightly soluble (SS)	From 100 to 1000	1-10	1
Very slightly soluble (VSS)	From 1000 to 10,000	0.1-1	0.1
Practically insoluble (PI)	>10,000	<0.1	0.01

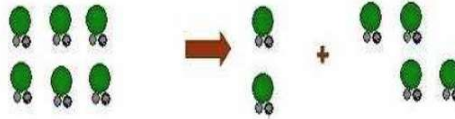
Mechanism of solubility

Step 1



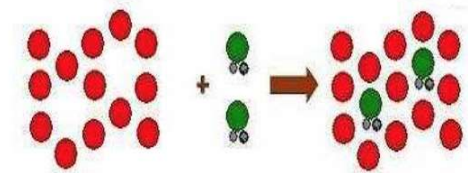
Holes open in the solvent

Step 2



Molecules of the solid breaks away
from the bulk

Step 3



The freed solid molecule is
integrated into the hole in the
solvent

- Accordingly , there will be endothermic and exothermic process of solubilization. °
- The solubility of carbonated water is

Solvent-Solute Interactions

Like dissolves Like

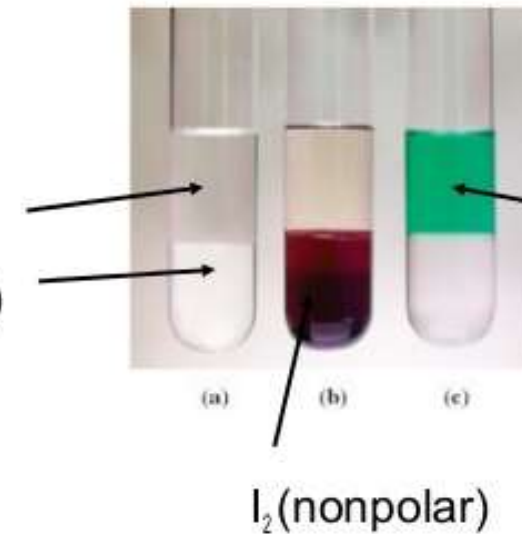
- *Water for salts and sugars*
- *Mineral oils for substances that are slightly soluble in water*

Solute	Solvent	
	Polar	Nonpolar
Ionic	Soluble	Insoluble
Polar	Soluble	Insoluble
Nonpolar	Insoluble	Soluble

Solvents

Water (polar)

CH₂Cl₂ (nonpolar)



Solutes

Ni(NO₃)₂
(polar)

I₂ (nonpolar)

Polar solvents

Water can dissolve solutes by different mechanisms

- ***Dipolar interaction (eg: Water dissolves ionic solutes)***
- ***H-bonding (eg: Water dissolves Alcohols, phenols, aldehydes, ketones and amines.)***
- ***What are the effect of R group on water miscibility?***

