

KINDS OF SOLUTIONS

Kind of Solution

Example

Gas in gas

Air (O_2 , N_2 , Ar, and other gases)

Gas in liquid

Carbonated water (CO_2 in water)

Gas in solid

H_2 in palladium metal

Liquid in liquid

Gasoline (mixture of hydrocarbons)

Liquid in solid

Dental amalgam (mercury in silver)

Solid in liquid

Seawater (NaCl and other salts in water)

Solid in solid

Metal alloys, such as sterling silver (92.5% Ag, 7.5% Cu)

Table 22-3

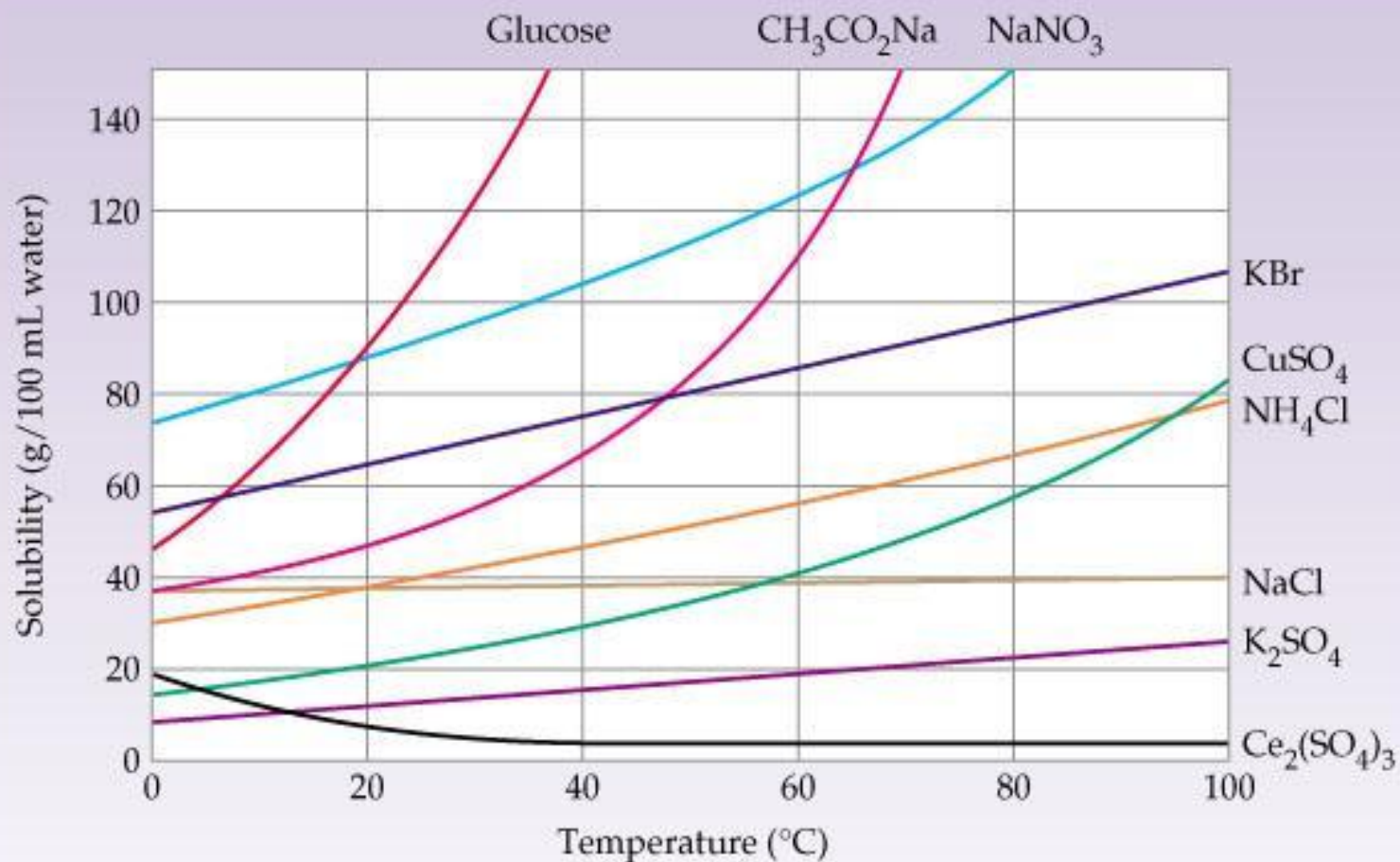
Properties of Solutions, Colloids, and Suspensions

Solutions	Colloids	Suspensions
Do not settle out	Do not settle out	Settle out on standing
Pass unchanged through ordinary filter paper	Pass unchanged through ordinary filter paper	Separated by ordinary filter paper
Pass unchanged through membrane	Separated by a membrane	Separated by a membrane
Do not scatter light	Scatter light	Scatter light
Affect colligative properties	Do not affect colligative properties	Do not affect colligative properties

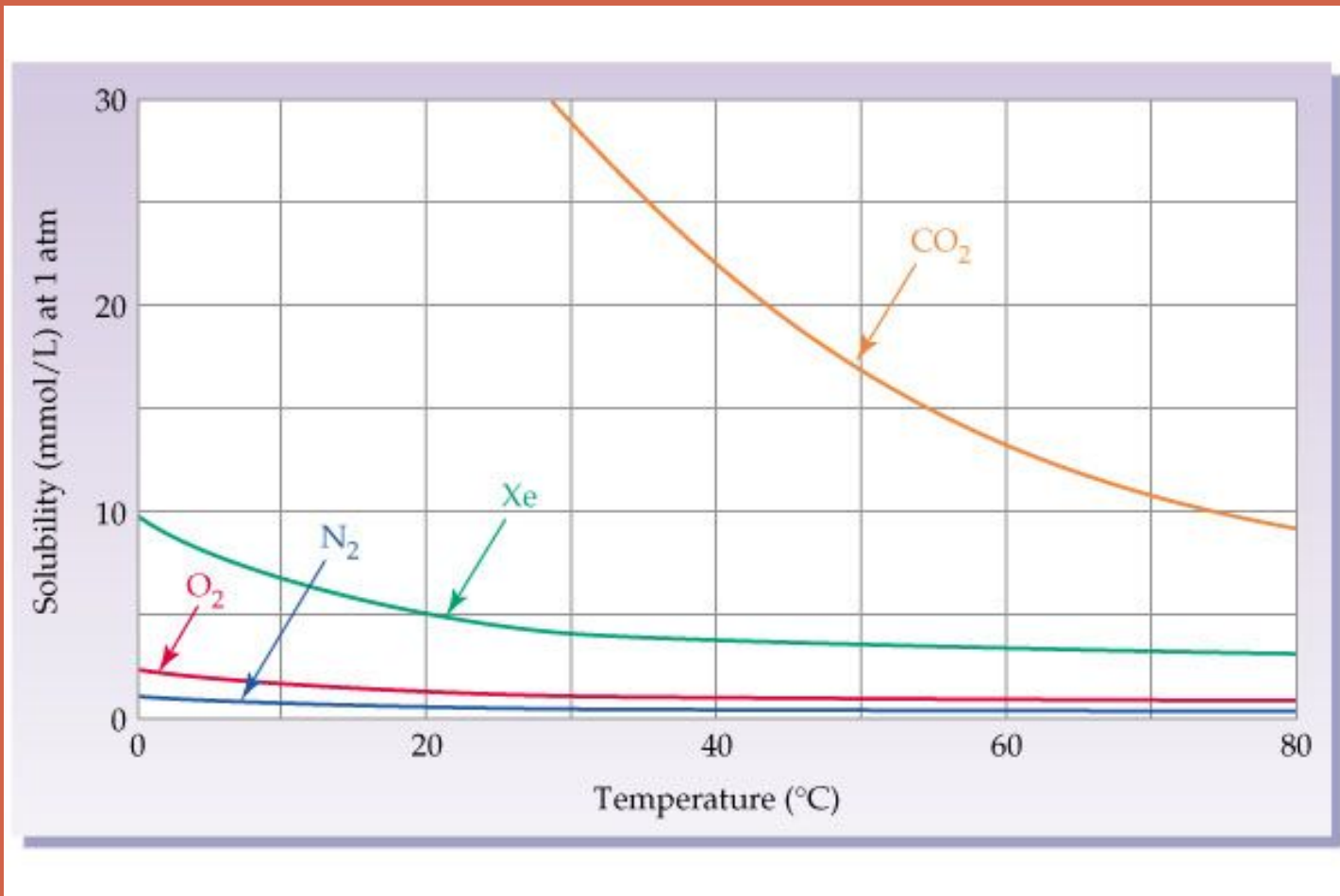
SOLUBILITY

- The amount of solute per unit solvent required to form a saturated solution is called the solute's **Solubility**.
- When two liquids are completely soluble in each other they are said to be **Miscible**.
- Solubility is effected by Temperature. With increase in temperature solubility of most of the substances increases.
- Most gases become less soluble in water as the temperature increases.

SOLUBILITY GRAPH OF SALTS IN WATER



SOLUBILITY GRAPH OF GASES IN WATER



Pressure has little effect on the solubility of liquids and solids. The solubility of gases is strongly influenced by pressure. Gases dissolve more at high pressure.

SOLUBILITY OF COMMON IONS IN WATER

Soluble Compounds		Important Exceptions
Compounds containing	NO_3^-	None
	$\text{C}_2\text{H}_3\text{O}_2^-$	None
	Cl^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	Br^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	I^-	Compounds of Ag^+ , Hg_2^{2+} , and Pb^{2+}
	SO_4^{2-}	Compounds of Sr^{2+} , Ba^{2+} , Hg_2^{2+} , and Pb^{2+}
Insoluble Compounds		Important Exceptions
Compounds containing	S^{2-}	Compounds of NH_4^+ , the alkali metal cations, and Ca^{2+} , Sr^{2+} , and Ba^{2+}
	CO_3^{2-}	Compounds of NH_4^+ and the alkali metal cations
	PO_4^{3-}	Compounds of NH_4^+ and the alkali metal cations
	OH^-	Compounds of the alkali metal cations, and Ca^{2+} , Sr^{2+} , and Ba^{2+}

DISSOLUTION OF SODIUM CHLORIDE IN WATER

