

Normalni uvjeti tlaka i temperature (n.u.): $p=101\,325\text{ Pa}$ $T=273,15\text{ K}$

Standardni uvjeti tlaka i temperature(s.u.): $p=100\,000\text{ Pa}$ $T=298,15\text{ K}$

Avogadrova konstanta $N_A=L=6,022\cdot 10^{23}\text{ mol}^{-1}$

Opća plinska konstanta $R=8,314\text{ Pa m}^3\text{ mol}^{-1}\text{ K}^{-1}$

Molarni volumen pri s.u. $V_m=22,4\text{ mol}^{-1}\text{ dm}^3$

FIZIKALNA VELIČINA		OSNOVNA SI JEDINICA	
NAZIV	SIMBOL	NAZIV	SIMBOL
Duljina	l	Metar	M
Masa	m	Kilogram	kg
Vrijeme	T	Sekunda	s
Električna struja	I	Amper	A
Termodinamička temperatura	T	Kelvin	K
Množina tvari	n	Mol	mol

Fizikalna veličina	Oznaka	Formula	Jedinica
Množina	$n(X)$	$n=\frac{m(X)}{M(X)}=\frac{N(X)}{L}=\frac{V^{\circ}(X)}{V^{\circ}m(X)}$	mol
Molarna masa	M		g mol^{-1}
Gustoća	ρ	$\rho(\text{otopine})=\frac{m(\text{otopine})}{V(\text{otopine})}$	g cm^{-3}
Molalitet ili molalnost	$b(X)$	$b(X)=\frac{n(X)}{m(\text{otapala})}$	mol kg^{-1}
Množinska koncentracija	$c(X)$	$c(x)=\frac{n(X)}{V(\text{otopine})}$	mol dm^{-3}

Masena koncentracija	$\gamma(X)$	$\gamma(X) = \frac{m(X)}{V(\text{otopine})}$	g dm^{-3}
Množinski udio	$x(X)$	$x(X) = \frac{n(X)}{n(\text{ukupna})}$	1
Maseni udio	$w(X)$	$w(X) = \frac{m(X)}{m(\text{ukupna})}$	1
Volumni udio	$\varphi(X)$	$\varphi(X) = \frac{V(X)}{V(\text{ukupni})}$	1

$$m(\text{ukupna}) = m(\text{otopine}) = m(\text{smjese}) = m(\text{otopljena tvar}) + m(\text{otapalo})$$

$$m(\text{otapalo}) > m(\text{otopljena tvar})$$

$$X = \text{otopljena tvar}$$

$$c(X) = \frac{n(X)}{V(\text{otopine})} = \frac{m(X)}{M(X) \cdot V(\text{otopine})} = \frac{w(X) \cdot m(\text{otopine})}{M(X) \cdot V(\text{otopine})} = \frac{w(X) \cdot \rho(\text{otopine})}{M(X)}$$

$$c(X) = \frac{n(X)}{V(\text{otopine})} = \frac{m(X)}{M(X) \cdot V(\text{otopine})} = \frac{\gamma(X)}{M(X)}$$

$$\text{Opća plinska jednažba: } p(X)V(X) = n(X)RT$$

$$\text{Osmotski tlak: } \Pi = c(X)RT$$

$$\text{Tlak para otopine: } p(\text{tlak para otapala iznad otopine}) = x(\text{otapala u otopini}) \cdot p^\circ(\text{tlak para čistog otapala})$$

$$\text{Povišenje vrelišta: } \Delta T = T_v(\text{otopine}) - T_v(\text{otapalo}) = K_{\text{eb}} \cdot b(X) \cdot i$$

$$\text{Sniženje tališta (ledišta): } \Delta T = T_t(\text{otapalo}) - T_t(\text{otopine}) = K_{\text{kr}} \cdot b(X) \cdot i$$

$$i = 1 \text{ za organske tvari (saharoza, glukoza, naftalen)}$$

$$i \neq 1 \text{ za tvari koje disociraju (anorganske soli)}$$

$$\Delta T = K_{\text{kr}} \cdot b(X) \cdot i = K_{\text{kr}} \cdot \frac{n(X)}{m(\text{otapala})} \cdot i = K_{\text{kr}} \cdot \frac{m(X)}{m(\text{otapala}) \cdot M(X)} \cdot i$$

$$\Delta T = K_{\text{eb}} \cdot b(X) \cdot i = K_{\text{eb}} \cdot \frac{n(X)}{m(\text{otapala})} \cdot i = K_{\text{eb}} \cdot \frac{m(X)}{m(\text{otapala}) \cdot M(X)} \cdot i$$