

| Concentration of solute -<br>SOUGHT 9 | Concentration of solute (component "A") - GIVEN                              |                                       |  |  |
|---------------------------------------|--|---------------------------------------|--|--|
|                                       | $[\%_A]$   | $b_A$                                 | $C_M$  | $X_A$  |
| $[\%_A]$                              | ---  | $\frac{100b_A M_A}{b_A M_A + 1000}$   | $\frac{C_M M_A}{10\rho}$                     | $\frac{100X_A M_A}{X_A M_A + (1 - X_A) M_B}$   |
| $b_A$                                 | $\frac{1000[\%_A]}{M_A (100 - [\%_A])}$                                      | ---                                   | $\frac{1000C_M}{1000\rho - C_M M_A}$         | $\frac{1000X_A}{(1 - X_A) M_B}$                |
| $C_M$                                 | $\frac{10[\%_A]\rho}{M_A}$   | $\frac{1000\rho b_A}{b_A M_A + 1000}$ | ---  | $\frac{1000\rho X_A}{(1 - X_A) M_B + X_A M_A}$ |
| $X_A$                                 | $\frac{\frac{[\%_A]}{M_A}}{\frac{[\%_A]}{M_A} + \frac{(100 - [\%_A])}{M_B}}$ | $\frac{b_A M_B}{b_A M_B + 1000}$      | $\frac{C_M M_B}{1000\rho + C_M (M_B - M_A)}$ | ---  |

Symbols:

$b_A$  / molality of solute

$C_M$  / molarity of solute

$M_A$  / molar mass of solute

$M_B$  / molar mass of solvent

$X_A$  / mole fraction of solute

$[\%_A]$  / percent of solute

$D$  / density in  $\text{g mL}^{-1}$