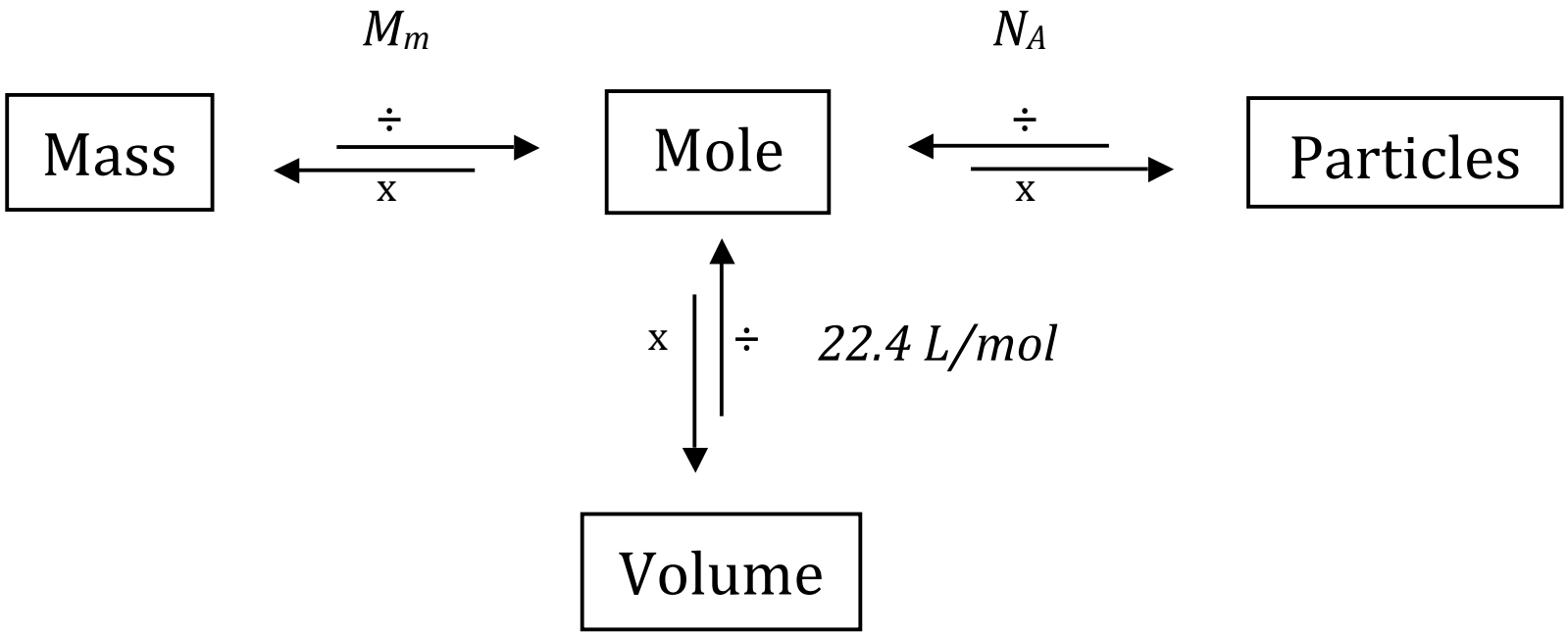
Name: _____
HR: _____
Date: _____
DP Physics

# Converting Moles




$N_A$ = Avogadro's Constant = $6.02 \times 10^{23}$
$M_m$ = Molar mass of the element; unique to each element

Sample Problems

## 1) May '07, Standard Level, Paper 2, Timezone 1, Question B3

(b) (i) The density of copper is $8.93\times10^{3}\,\text{kg}\,\text{m}^{-3}$ and its molar mass is 64 g. Deduce that the number of moles of copper in a volume of $1.0\,\text{m}^{3}$ is $1.4\times10^{5}$. *[2]*

(ii) Estimate the number of conduction electrons in $1.0\,\text{m}^{3}$ of copper.

## 2) May '03, Standard Level, Paper 2, Question A3

(b) The internal volume of a gas cylinder is $2.0\times10^{-2}\,\text{m}^{3}$. An ideal gas is pumped into the cylinder until the pressure becomes 20 MPa at a temperature of 17 °C.

Determine

(i) the number of moles of gas in the cylinder. *[2]*

(ii) the number of gas atoms in the cylinder. *[2]*