

# Particles & the Mole continued

Formula units  
ions  
atoms  
molecules

$$1 \text{ mole} = 6.02 \times 10^{23} \text{ particles}$$

Ex) How many formula units are in 2.25 moles of chromium (III) oxalate?

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$$\frac{2.25 \text{ mol} \times 6.02 \times 10^{23} \text{ f.u.}}{\therefore 1 \text{ mol}}$$

$$= 1.35 \times 10^{24} \text{ f.u.}$$

$\text{Cr}_2(\text{C}_2\text{O}_4)_3$

How many molecules of sugar  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$  are in 12.0 moles?

"Ooooh!"  
"Eehh"

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$$\frac{12.0 \text{ mol} \times 6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}}$$

$$= 7.22 \times 10^{24} \text{ molecules}$$

$\text{C}_{12}\text{H}_{22}\text{O}_{11}$

How many hydrogen atoms are in the 12.0 moles of  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$  from above?

$$1 \text{ molecule } \text{C}_{12}\text{H}_{22}\text{O}_{11} = 22 \text{ atoms H}$$

$$\frac{7.22 \times 10^{24} \text{ molecules}}{1 \text{ molecule}} \times 22 \text{ atoms}$$

$$= 1.59 \times 10^{26} \text{ atoms H}$$

How many carbon atoms are in 12.0 moles of  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ ?

$$1 \text{ molecule } \text{C}_{12}\text{H}_{22}\text{O}_{11} = 12 \text{ atoms C}$$

$$\frac{7.22 \times 10^{24} \text{ molecules}}{1 \text{ molecule}} \times 12 \text{ atoms}$$

$$= 8.66 \times 10^{25} \text{ atoms C}$$