Molar Mass and Mole Conversions

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

Use atomic masses from the 2025 periodic table. For a pure substance, n = m/M, where M is its molar mass in grams per mole.

1 What is the molar mass of $MgCl_2$?

(1) 59.76 g/mol

(2) 70.90 g/mol

(3) 83.32 g/mol

(4) 95.21 g/mol

2 Calculate the mass of 0.240 mol of H_2O. Show the molar mass and conversion. [1]

Answer and work

_____

_____

3 How many oxygen atoms are counted per formula unit of $Ca(NO_3)_2$ when finding its molar mass? Explain how the subscripts apply. [1]

Answer and work

_____

_____

4 How many moles of CO_2 are in a 22.0 g sample? Round to three significant figures.

(1) 0.250 mol

(2) 0.500 mol

(3) 2.00 mol

(4) 44.0 mol

Comparing Solid Samples

Use the information below to answer the questions.

A stockroom labels three pure solid samples. Use the masses in the table to compare the amount of each compound.

Sample	Compound	Mass (g)
P	NaCl	29.22
Q	KCl	37.28
R	NaCl	58.44

5 Calculate the amount, in moles, of NaCl in sample P. Show the molar mass and conversion. [1]

Answer and work

6 Which pair contains approximately the same number of moles of compound?

(1) P and Q

(2) P and R

(3) Q and R

(4) All three samples

7 Explain why sample Q can have a greater mass than sample P yet contain about the same number of moles. [1]

Answer and work

8 If half of sample R is removed, how many moles of NaCl remain?

(1) 0.2500 mol

(2) 0.5000 mol

(3) 1.000 mol

(4) 2.000 mol