

### Molarity Worksheet

1. Sea water contains roughly 28.0 g of NaCl per liter. What is the molarity of sodium chloride in sea water?
2. What is the molarity of 245.0 g of  $\text{H}_2\text{SO}_4$  dissolved in 1.00 L of solution?
3. What is the molarity of 5.30 g of  $\text{Na}_2\text{CO}_3$  dissolved in 400.0 mL solution?
4. What is the molarity of 5.00 g of NaOH in 750.0 mL of solution?
5. How many moles of  $\text{Na}_2\text{CO}_3$  are there in 10.0 L of 2.0 M solution?
6. How many moles of  $\text{Na}_2\text{CO}_3$  are in 10.0 mL of a 2.0 M solution?
7. How many moles of NaCl are contained in 100.0 mL of a 0.20 M solution?
8. What weight (in grams) of NaCl would be contained in problem 7?
9. What weight (in grams) of  $\text{H}_2\text{SO}_4$  would be needed to make 750.0 mL of 2.00 M solution?
10. What volume (in mL) of 18.0 M  $\text{H}_2\text{SO}_4$  is needed to contain 2.45 g  $\text{H}_2\text{SO}_4$ ?
11. What volume (in mL) of 12.0 M HCl is needed to contain 3.00 moles of HCl?
12. How many grams of  $\text{Ca}(\text{OH})_2$  are needed to make 100.0 mL of 0.250 M solution?
13. What is the molarity of a solution made by dissolving 20.0 g of  $\text{H}_3\text{PO}_4$  in 50.0 mL of solution?
14. What weight (in grams) of KCl is there in 2.50 liters of 0.50 M KCl solution?
15. What is the molarity of a solution containing 12.0 g of NaOH in 250.0 mL of solution?
16. Determine the molarity of these solutions:
  - a) 4.67 moles of  $\text{Li}_2\text{SO}_3$  dissolved to make 2.04 liters of solution.
  - b) 0.629 moles of  $\text{Al}_2\text{O}_3$  to make 1.500 liters of solution.
  - c) 4.783 grams of  $\text{Na}_2\text{CO}_3$  to make 10.00 liters of solution.
  - d) 0.897 grams of  $(\text{NH}_4)_2\text{CO}_3$  to make 250 mL of solution.
  - e) 0.0348 grams of  $\text{PbCl}_2$  to form 45.0 mL of solution.
17. Determine the number of moles of solute to prepare these solutions:
  - a) 2.35 liters of a 2.00 M  $\text{Cu}(\text{NO}_3)_2$  solution.
  - b) 16.00 mL of a 0.415-molar  $\text{Pb}(\text{NO}_3)_2$  solution.
  - c) 3.00 L of a 0.500 M  $\text{MgCO}_3$  solution.
  - e) 6.20 L of a 3.76-molar  $\text{Na}_2\text{O}$  solution.
18. Determine the grams of solute to prepare these solutions:
  - a) 0.289 liters of a 0.00300 M  $\text{Cu}(\text{NO}_3)_2$  solution.
  - b) 16.00 milliliters of a 5.90-molar  $\text{Pb}(\text{NO}_3)_2$  solution.
  - c) 508 mL of a 2.75-molar NaF solution.
  - d) 6.20 L of a 3.76-molar  $\text{Na}_2\text{O}$  solution.
  - e) 0.500 L of a 1.00 M KCl solution.
  - f) 4.35 L of a 3.50 M  $\text{CaCl}_2$  solution.
19. Determine the final volume of these solutions:
  - a) 4.67 moles of  $\text{Li}_2\text{SO}_3$  dissolved to make a 3.89 M solution.
  - b) 4.907 moles of  $\text{Al}_2\text{O}_3$  to make a 0.500 M solution.
  - c) 0.783 grams of  $\text{Na}_2\text{CO}_3$  to make a 0.348 M solution.
  - d) 8.97 grams of  $(\text{NH}_4)_2\text{CO}_3$  to make a 0.250-molar solution.
  - e) 48.00 grams of  $\text{PbCl}_2$  to form a 5.0-molar solution.