

Concentration Calculations

mol/L concentrations

Use the formula $c=n/V$. Write down the given before solving. Remember, that a mass can be converted into n using the molar mass (or vice versa).

1. What is the concentration of a 450 mL solution that contains:
 - a) 34 mol of sodium oxalate?
 - b) 2.3 mol of calcium chloride?
2. What is the concentration of a 40 mL solution that contains:
 - a) 1.4 g of potassium nitrate?
 - b) 0.063 g of sodium chlorate?
3. Determine the volume of a solution that could be made for each of the following:
 - a) a 0.35 mol/L solution using 2.2 mol of potassium dichromate
 - b) a 3.4 mol/L solution using 56.4 g of sodium nitride
4. How many grams of NaI do you have in 50 mL of a 1.2 mol/L solution?
5. If you wanted to make 25 mL of a 0.251 mol/L solution of potassium phosphate, how many grams would you need?
6. While eating at Swiss Chalet, you accidentally spill the contents of a full salt shaker into your coffee. Being the chemist that you are, you go into the kitchen and find the mass of the salt that will fit into one salt shaker using the scale they use for meat. If there was 56 g of salt and your coffee is 245 mL, what is the concentration of the solution? Is it still a good idea to drink the coffee?
7. A city of Niagara Falls dump truck is spreading salt in the winter. The road conditions are very bad and the driver very tired. Unwittingly, the driver veers off the road and crashes into the reservoir. The entire truck load of salt (2400 kg of NaCl) mixes into the reservoir water (23 million litres). What is the concentration of the salt water solution?

Text Questions

p. 242 pp (1.2 mol/L)

p. 243 pp (0.0154 mol/L)

p. 244 pp (0.413 L)

p. 253 #2a) 0.1 mol/L b) 0.05 mol/L c) 0.2 mol/L, #4. 41.7 L, #5. 2.25 g, #6. 1.81 g

% concentrations

1. If 15 mL of rubbing alcohol is dissolved in water to make an 85 mL solution (total volume), what is the concentration of alcohol (v/v)?
2. If a glass of wine (35 mL) is 12% ethanol (v/v), how many mL of pure alcohol are there?
3. A baseball bat has a mass of 760 g. If a chemist separates all the different elements used to make the bat and finds that 643 g of the bat are aluminum, what is the % concentration Al (m/m)?
4. A sample of ocean water contains 2.1% magnesium chloride (m/v). How many grams of magnesium chloride are in 450 mL of ocean water?
5. A 250 mL glass of water has a mercury concentration of 67 ppb. How many grams of mercury are in the glass?
6. A teaspoon of sugar (4.5 g) is accidentally spilled in a swimming pool. If the final concentration of the sugar in the water is 3.2 ppm, what is the volume of the pool in litres?
7. Suppose you dissolve 0.035 g of potassium sulfate in water. The final mass of the solution is 126 g. Assume the density of the solution is the same as water. Express the concentration in
 1. mol/L
 2. m/v %
 3. ppm
 4. ppbWhich would be the most useful units to express concentration in?
8. Look on some common household products. Find 2 examples of each of m/v, v/v concentrations.
9. p. 256 #3