

Concentration Review

Directions: Determine the answer for the questions on a separate piece of paper. Write the number of the question then show all relevant work. You do not need to rewrite the question. Circle your final answer which should have the appropriate significant figures and units. Make sure your name is on the paper you turn in. If more than one sheet of paper is used they must be STAPLED together. (There is no acceptable substitute for a staple.) You do not need to turn in this page.

1. What is the concentration of sodium ion, in parts per million, when 0.7091 g Na_2CO_3 are dissolved in water to make 250.0 mL of solution?

2. Determine the concentration, in ppm, of fluoride ion in each of the solutions described below:

Stock solution: 0.5234 g of NaF dissolved to make 100.0 mL of solution

Solution 1: 10.00 mL of stock solution diluted to a total volume of 150.0 mL

Solution 2: 5.00 mL of solution 1 diluted to a total volume of 200.0 mL

3. An instrumental method was used to determine that the concentration of iron in solution X was 46.96 ppm Fe. This solution X was made by diluting 15.00 mL of solution A to a volume of 100.0 mL. Solution A was made by dissolving 1.4223 g of sample in a total volume of 200.0 mL. What is the percent iron in the sample?

4. 1.000 L of water was passed through a solid phase extractor. The benzene in the water adsorbed to the solid phase and was then eluted using 15.00 mL of hexane. The concentration of benzene in the hexane was determined to have a concentration of 7.47 mg/L. What was the concentration of benzene in the initial water sample?

5. A unknown solution had a concentration of copper designated as C_{Cu} . A standard solution of copper had a concentration of 61.55 ppm. Write an expression for the concentration of copper ($[\text{Cu}] =$) in a solution where 25.00 mL of unknown solution was mixed with 3.00 mL of copper standard.

6. The solution in question 5 gave an analytical signal of 0.808. The unknown solution alone had an analytical signal of 0.144. What is the concentration of copper in the unknown? (Signal is proportional to concentration; i.e., $S = kc$)