

Chemistry 11.
Dilution problems.

Answers

1. Calculate the new concentration when the following solutions are mixed together:

a) 25.0 mL of 3.00 M HCl is diluted to a final volume of 100.0 mL. 0.75 M

b) 25.0 mL of water is added to 110.0 mL of a 3.00 M HCl 2.44 M

c) 1.0 L of 0.33 M NaOH and 0.50 L of 0.22 M NaOH 0.29 M

d) 15.00 mL of 0.0500 M LiOH is mixed with 35.00 mL of 0.040 M LiOH .

moles A = 0.00075 mol

B = 0.00014 mol

total B = $2.15 \times 10^{-3}\text{ mol}$

final conc. = $\frac{2.15 \times 10^{-3}\text{ mol}}{0.0500\text{ L}}$

e) 15.00 mL of 0.0500 M LiOH is mixed with 45.00 mL of water.

0.043 M

0.0125 M

2. What is the molarity of the solution produced when 500.0 mL of a 0.65 M solution of KBr is boiled down to a final volume of 125.0 mL

2.6 M

3. 45.0 mL of a 1.25M solution of HCl has some water added to it changing the concentration of the acid to 0.800 M. What volume of water was added?

1.25

1.56

$70 - 45 = 25\text{ mL}$

4. What volume of a 3.0 M HCl is needed to make 500.0 mL of 0.20 M HCl solution?

0.033 L

5. What volume of a 6.0 M KOH is needed to make 200.0 mL of a 0.10 M solution?

3.3 mL

6. Determine the final concentration of LiOH when 75 mL of 0.23M LiOH is mixed with 27 mL of 0.11M LiOH.

$$\begin{array}{r} 0.01725 \\ 0.00297 \\ \hline \end{array}$$

0.199 M
0.20 M

7. Determine the final concentration of LiOH when 45mL of 0.222 M LiOH is mixed with 65 mL of 0.100M of KCl.

$$\begin{array}{r} 9.99 \times 10^{-3} \\ 6.5 \times 10^{-3} \end{array}$$

0.15 M

8. Determine the final concentration of NaCl when 75 mL of 0.110 M NaCl is mixed with 45 mL of water.

0.069 M

9. A 1.0L of 0.50 M NaOH is allowed to evaporate to a final volume of 0.200 L. What is the concentration of this new solution?

2.5 M

10. What is the concentration of KCl when equal volumes of a 0.35M and 0.45 M solutions are added together?

0.40 M