

The Mole and Molarity II

Revenge of the Mole

Name: KEY

1. How many atoms of Fe are in 6.43 moles of Fe?

$$3.87 \times 10^{24} \text{ atoms}$$

6. What would the mass of 30.3L of O_2 be at STP?

$$43.3 \text{ g}$$

2. How many moles are present in a 444.2g sample of Fe?

$$7.96 \text{ mol}$$

7. How many molecules of $K_2Cr_2O_7$ would be present in a 101.34g sample?

$$2.07 \times 10^{23} \text{ molecules.}$$

3. What would be the mass of 3.08×10^{-3} moles of K?

$$0.120 \text{ g}$$

8. If 2.3 moles of KOH were dissolved into 3L of water, what would the concentration be?

$$0.767 \text{ M} \\ (0.8 \text{ M})$$

4. How many moles would be present in 30.2L of CO_2 gas at STP?

$$1.35 \text{ mol}$$

9. How many moles of HCl are present in 900ml of 2M HCl solution?

$$2 \text{ mol} \\ (1.8 \text{ mol})$$

5. What volume would 2.45×10^{-2} moles of Cl_2 gas occupy at STP?

$$0.549 \text{ L}$$

10. What would be the concentration if 50g of NaCl were dissolved into 2L of water?

$$0.43 \text{ M}$$

11. What would be the concentration if 100g of NaCl were dissolved into 2L of water?

0.85M

16. What volume of 6M HCl would be required to produce 10L of 1.5M HCl solution?

2.5L

12. If 4.90×10^{23} molecules of NaOH were dissolved into 3.42L of water what would be the concentration?

0.238M

17. What volume of 10M NaOH would be needed to make 5L of 0.044M NaOH solution?

0.022L
= 22mL

13. What would the resulting concentration be if 4L of 6M HCl were diluted to a volume of 20L?

1.2M

18. What would be the final concentration if 23L of 1.2M NaOCl were diluted to a volume of 300L?

0.092M

14. What would the final concentration be if 20L of 0.03M NaOH was diluted to 100L in a bathtub?

0.006M

19. What would be the final concentration if 200ml of 0.3M HBr were diluted to 500ml?

0.12M

15. If 2L of a solution of unknown concentration was diluted to a volume of 10L and this final solution had a concentration of 2.3M, what was the concentration of the unknown solution?

11.5M

20. If 190ml of a solution of unknown concentration was diluted to a volume of 450.2ml and this final solution had a concentration of 3.0M, what was the concentration of the unknown solution?

7.1M