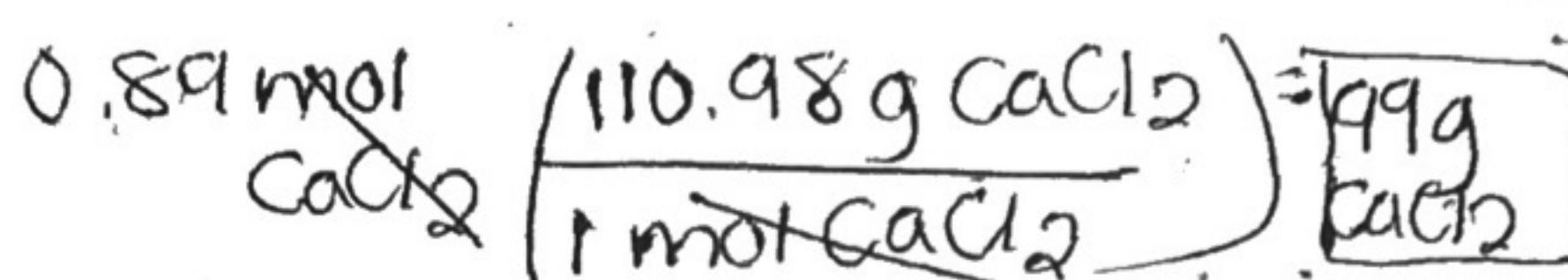
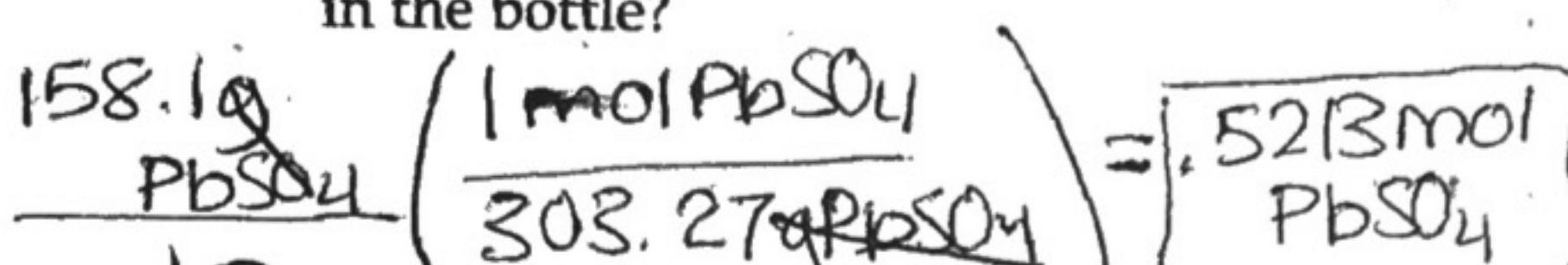


10-2 Practice Problems

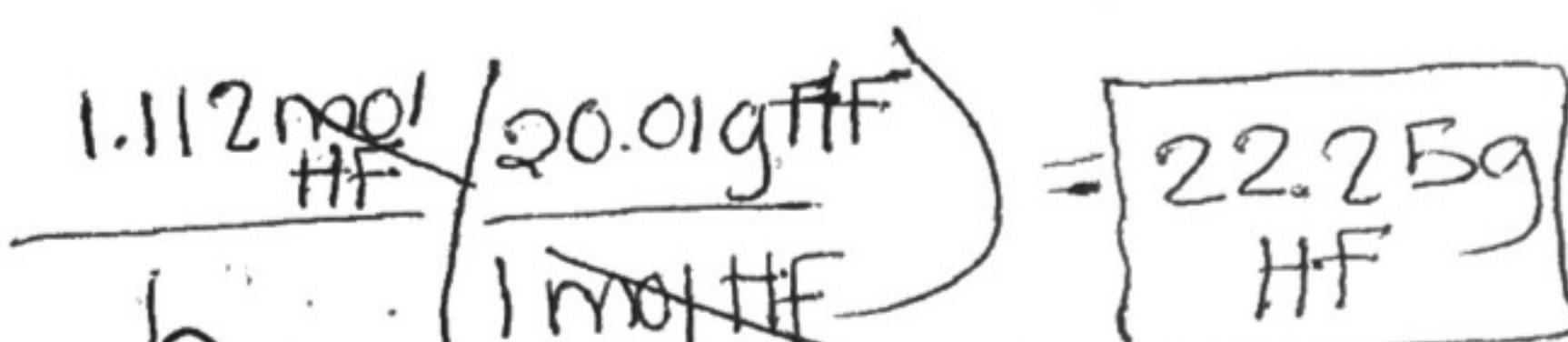
1. Find the mass of 0.89 mol of CaCl_2 .



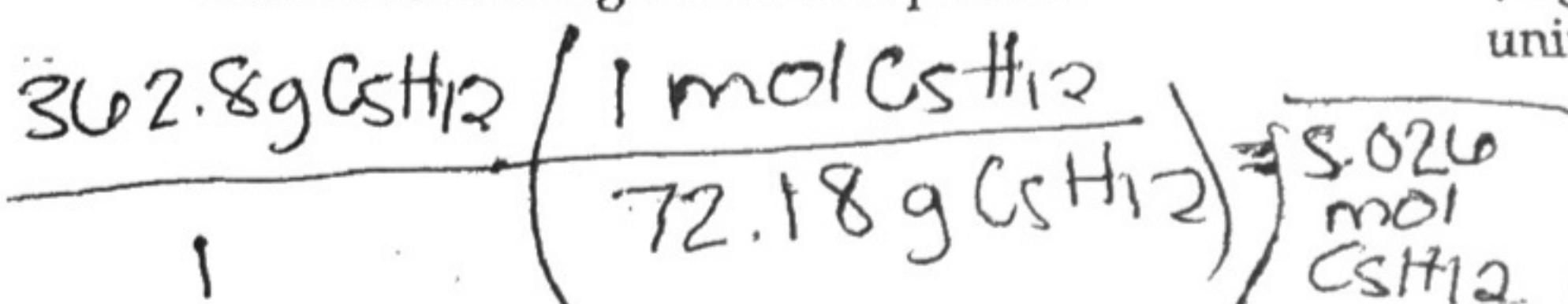
2. A bottle of PbSO_4 contains 158.1 g of the compound. How many moles of PbSO_4 are in the bottle?



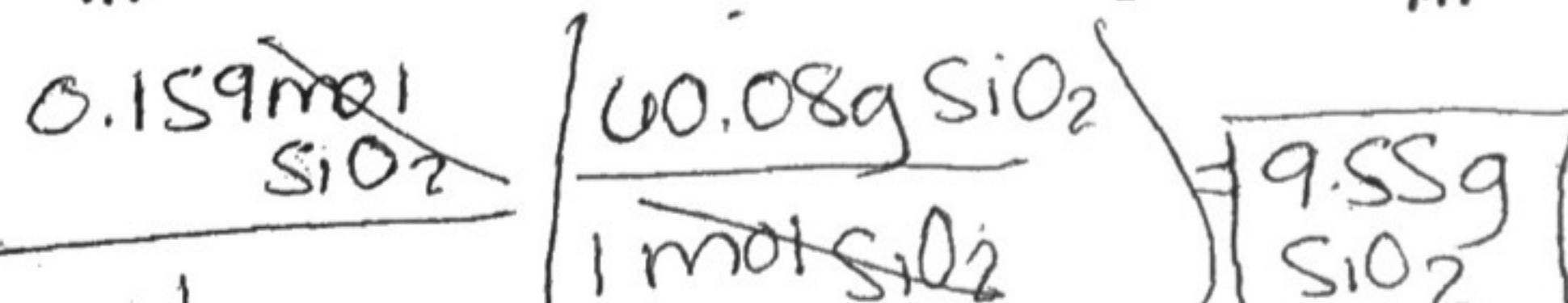
3. Find the mass of 4.112 mol of HF.



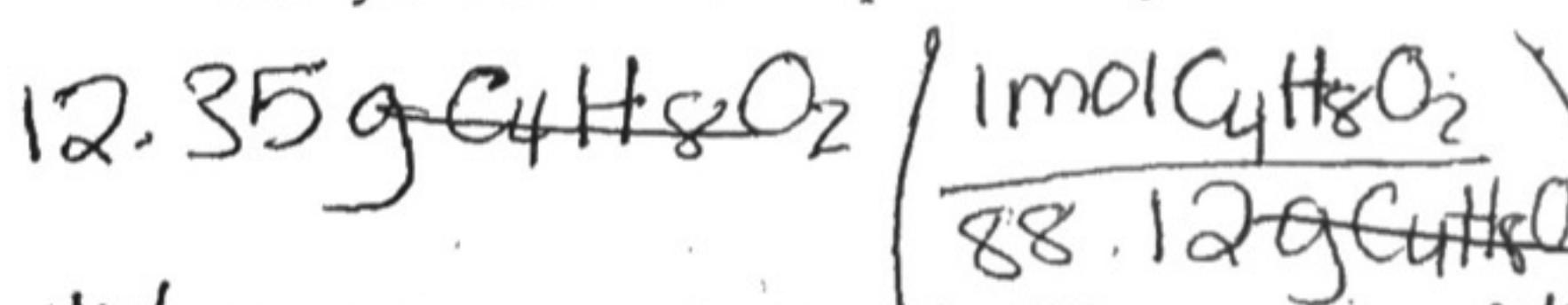
4. Determine the number of moles of C_5H_{12} that are in 362.8 g of the compound.



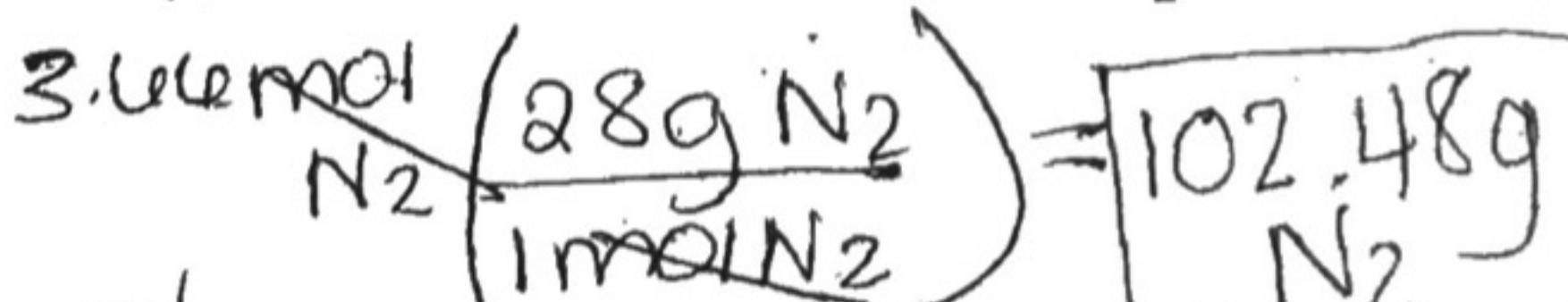
- HW5. Find the mass of 0.159 mol of SiO_2 .



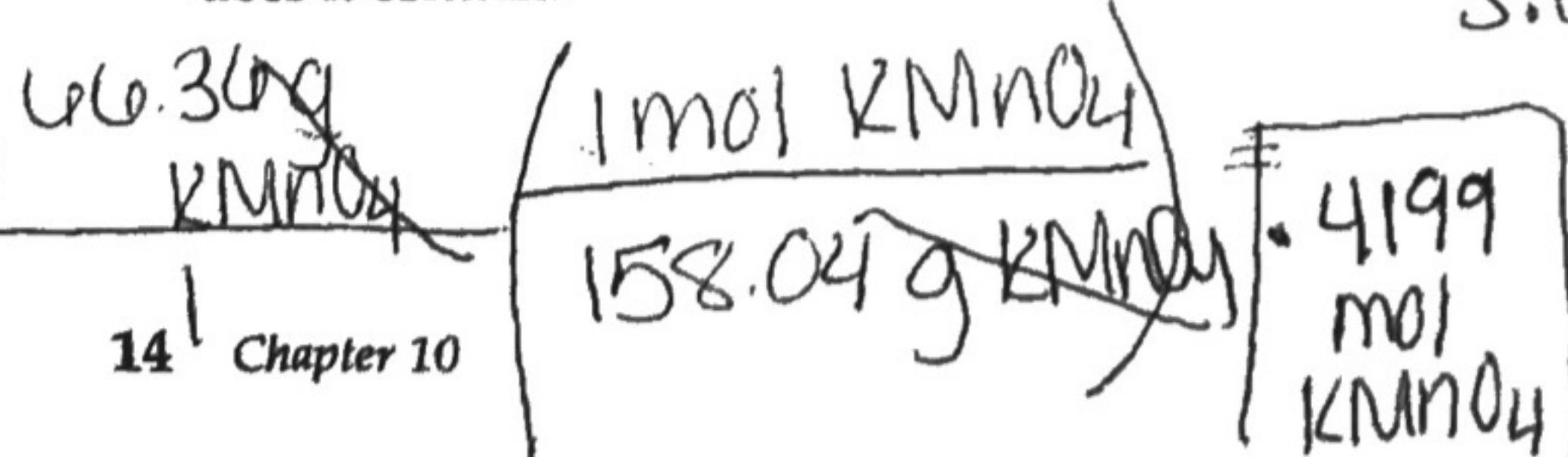
- HW6. You are given 12.35 g of $\text{C}_4\text{H}_8\text{O}_2$. How many moles of the compound do you have?



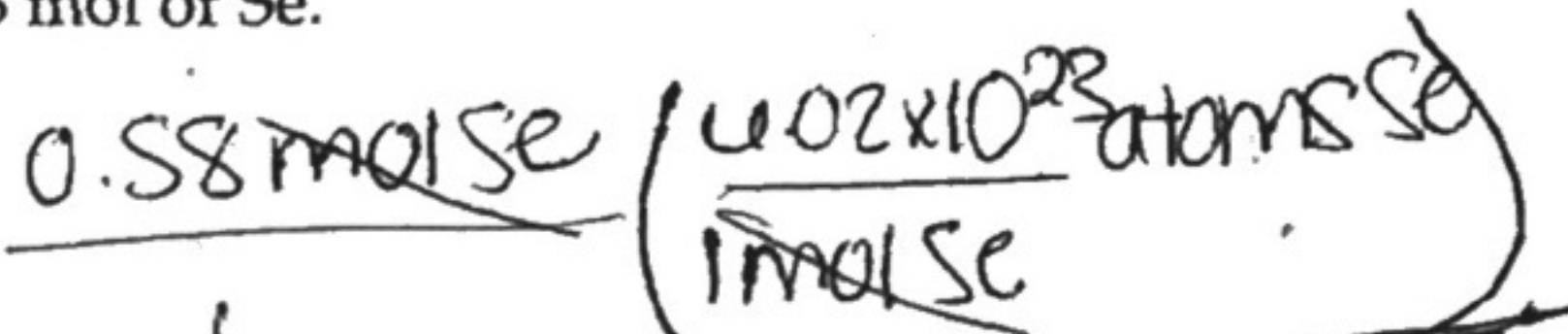
- HW7. Find the mass of 3.66 mol of N_2 .



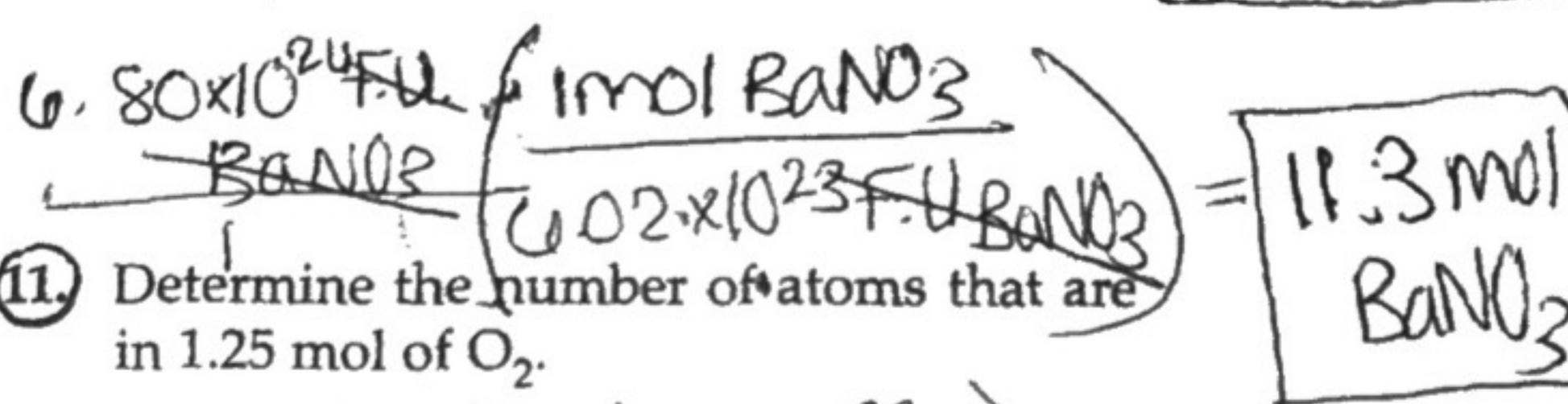
- HW8. A bottle of KMnO_4 contains 66.36 g of the compound. How many moles of KMnO_4 does it contain?



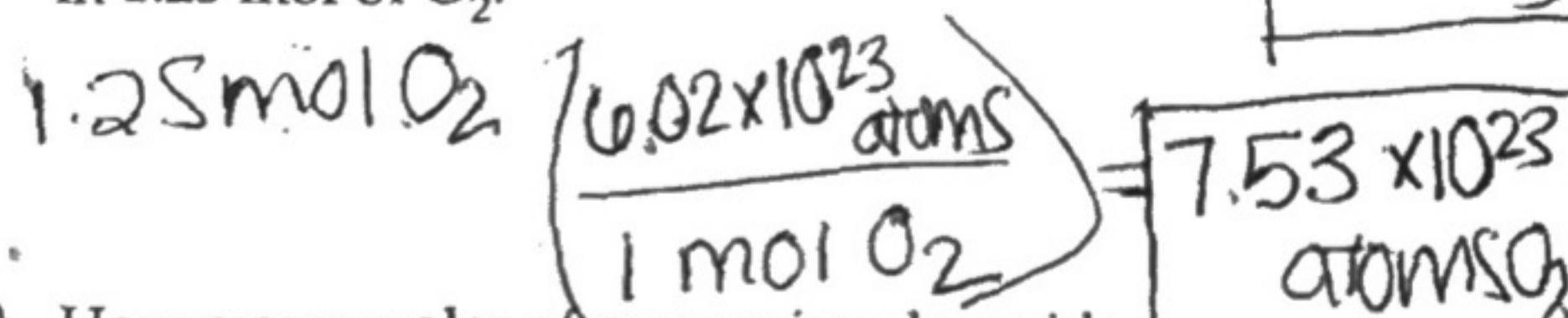
9. Determine the number of atoms that are in 0.58 mol of Se.



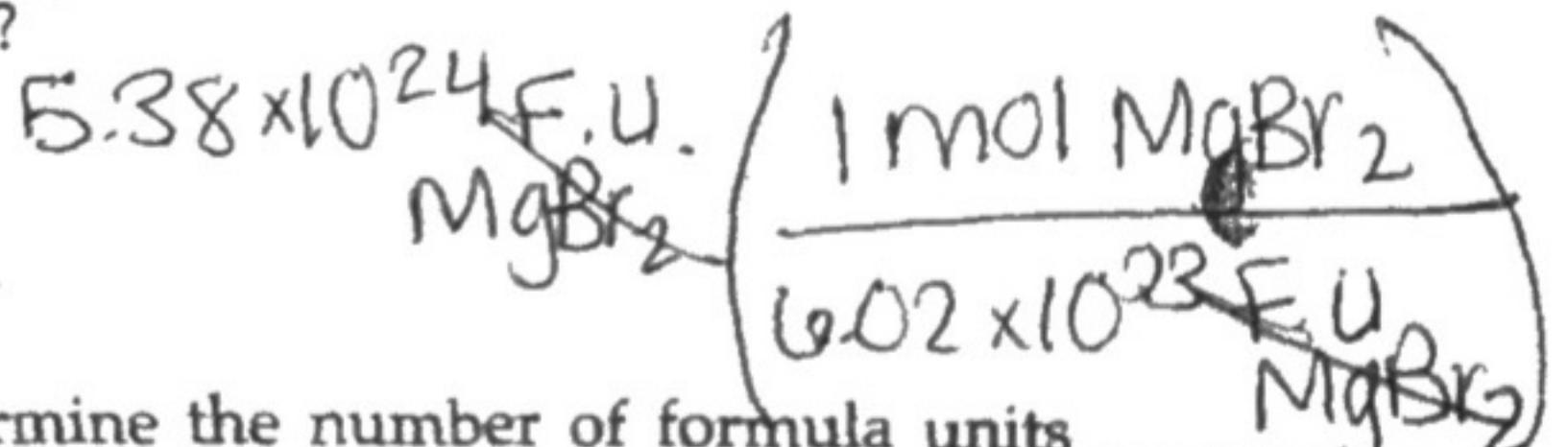
10. How many moles of barium nitrate (BaNO_3) contain 6.80×10^{24} formula units?



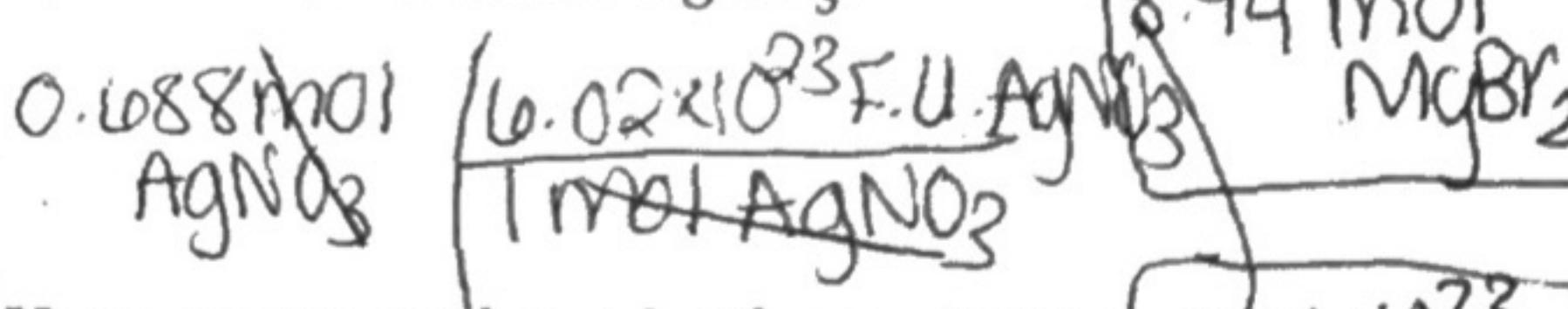
11. Determine the number of atoms that are in 1.25 mol of O_2 .



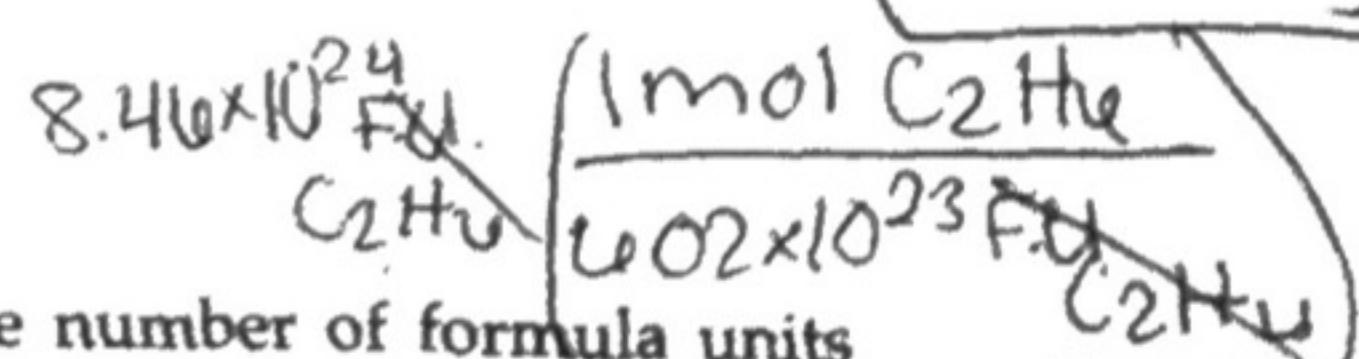
12. How many moles of magnesium bromide (MgBr_2) contain 5.38×10^{24} formula units?



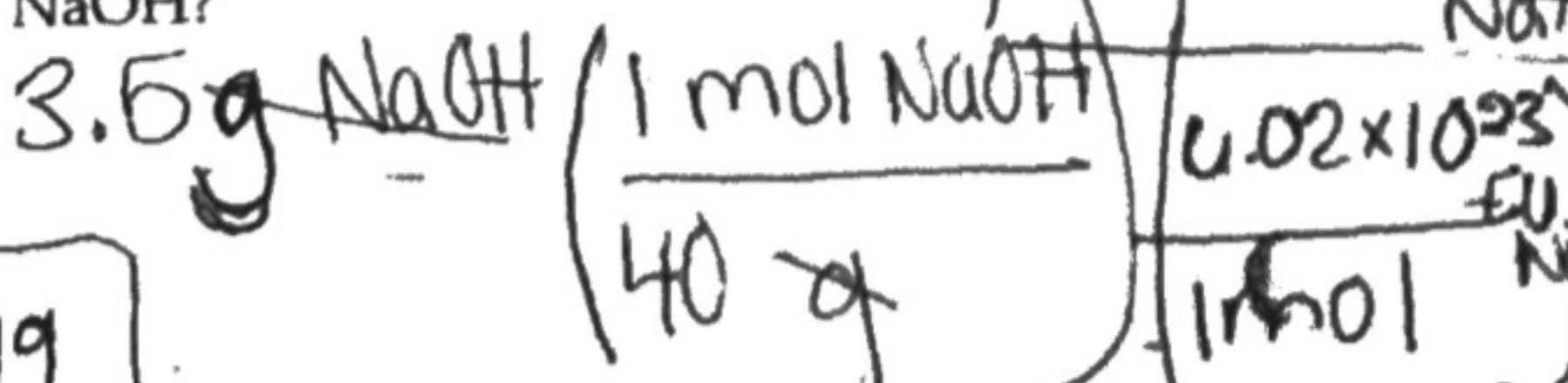
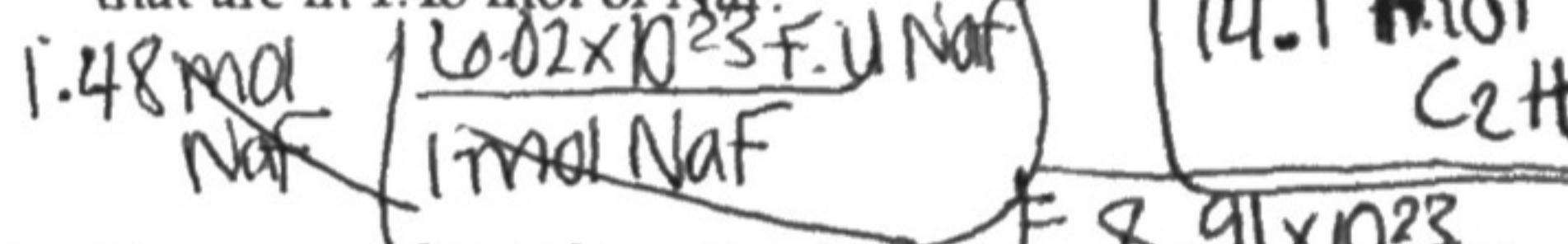
13. Determine the number of formula units that are in 0.688 mol of AgNO_3 .



- HW6. How many moles of ethane (C_2H_6) contain 8.46×10^{24} formula units?



- HW15. Determine the number of formula units that are in 1.48 mol of NaF .



10-2 Practice Problems (continued)

- molecules + 6
17. If you burned 6.10×10^{24} molecules of ethane (C_2H_6), what mass of ethane did you burn?

$$30.5 \text{ g } C_2H_6$$

$$6.10 \times 10^{24} \text{ molecules ethane} \left(\frac{1 \text{ mol } C_2H_6}{6.02 \times 10^{23} \text{ molecules } C_2H_6} \right) = 1 \text{ mol } C_2H_6$$

24. A chemical reaction produces 0.37 mol of N_2 gas. What volume will that gas occupy at STP?

$$30 \text{ g } C_2H_6 \left(\frac{1 \text{ mol } C_2H_6}{22.4 \text{ L}} \right) = 1 \text{ mol } C_2H_6$$

$$0.37 \text{ mol } N_2$$

$$\frac{22.4 \text{ L}}{1 \text{ mol } N_2} = 8.34 \text{ L } N_2$$

18. How many formula units are in 5.1 g of TiO_2 ?

$$5.1 \text{ g } TiO_2 \left(\frac{1 \text{ mol } TiO_2}{79.87 \text{ g } TiO_2} \right) = 0.02 \times 10^{23} \text{ formula units } TiO_2$$

19. What is the mass of 3.62×10^{24} molecules of methanol (CH_3OH)?

$$3.62 \times 10^{24} \text{ molecules } CH_3OH \left(\frac{1 \text{ mol } CH_3OH}{6.02 \times 10^{23} \text{ molecules } CH_3OH} \right) = 32.05 \text{ g } CH_3OH$$

26. A chemical reaction produces 13.8 mol of CO gas. What volume will that gas occupy at STP?

$$13.8 \text{ mol } CO \left(\frac{22.4 \text{ L } CO}{1 \text{ mol } CO} \right) = 309 \text{ L } CO$$

20. How many formula units are in 1.4 g of $PbCl_2$?

$$1.4 \text{ g } PbCl_2 \left(\frac{1 \text{ mol } PbCl_2}{278.1 \text{ g } PbCl_2} \right) = 6.02 \times 10^{23} \text{ formula units } PbCl_2$$

27. A tube with a volume of 3.68 L contains how many moles of neon gas at STP?

$$3.68 \text{ L } Ne \left(\frac{1 \text{ mol } Ne}{22.4 \text{ L } Ne} \right) = 0.164 \text{ mol } Ne$$

21. Determine the mass of 2.94×10^{24} molecules of decane ($C_{10}H_{22}$).

$$2.94 \times 10^{24} \text{ molecules } C_{10}H_{22} \left(\frac{1 \text{ mol } C_{10}H_{22}}{6.02 \times 10^{23} \text{ molecules } C_{10}H_{22}} \right) = 142.32 \text{ g } C_{10}H_{22}$$

28. A chemical reaction produces 0.884 mol of H_2S gas. What volume will that gas occupy at STP?

$$0.884 \text{ mol } H_2S \left(\frac{22.4 \text{ L } H_2S}{1 \text{ mol } H_2S} \right) = 19.8 \text{ L } H_2S$$

22. How many formula units are in 5.6 g of H_2S ?

$$5.6 \text{ g } H_2S \left(\frac{1 \text{ mol } H_2S}{34.09 \text{ g } H_2S} \right) = 6.12 \times 10^{23} \text{ formula units } H_2S$$

- A container with a volume of 101 L contains how many moles of argon gas at STP?

$$101 \text{ L } Ar \left(\frac{1 \text{ mol}}{22.4 \text{ L}} \right) = 4.51 \text{ mol } Ar$$

23. A container with a volume of 893 L contains how many moles of air at STP?

$$893 \text{ L } \left(\frac{1 \text{ mol}}{22.4 \text{ L}} \right) = 39.9 \text{ L}$$

30. A chemical reaction produces 138 mol of HBr gas. What volume will that gas occupy at STP?

$$138 \text{ mol } HBr \left(\frac{22.4 \text{ L}}{1 \text{ mol}} \right) = 30.9 \text{ L } HBr$$