

1. Write balanced equations for the following chemical reactions!

- a. $\text{NH}_3 + \text{H}_3\text{PO}_4 =$
- b. $\text{Al}_2\text{O}_3 + \text{SiO}_2 =$
- c. $\text{NaOH} + \text{H}_2\text{S} =$
- d. $\text{SO}_2 + \text{Ba}(\text{OH})_2 =$
- e. $\text{N}_2\text{O}_5 + \text{Li}_2\text{O} =$
- f. $\underline{\text{Zn}}(\text{OH})_2 + \text{CO}_2 =$
- g. $\text{H}_2\text{S} + \text{Bi}(\text{NO}_3)_3 =$
- h. $\text{Ca}(\text{OH})_2 + \text{H}_3\text{AsO}_4 =$
- i. $\underline{\text{Cd}}(\text{OH})_2 + \text{HClO}_4 =$
- j. $\text{Cr}_2\text{O}_3 + \text{SO}_3 =$

2. Write equations for the following chemical reactions with the given ratio!

- a. $\text{K}_2\text{SO}_4 + \text{H}_2\text{SO}_4 =$
- b. $\underline{\text{Ca}}\text{HPO}_4 + \text{H}_3\text{PO}_4 =$
- c. $\underline{\text{Ba}_3}(\text{PO}_4)_2 + 2 \text{H}_3\text{PO}_4 =$
- d. $\text{Na}_3\text{PO}_4 + 2 \text{HI} =$
- e. $\text{Na}_2\text{SO}_3 + \text{SO}_2 + \text{H}_2\text{O} =$
- f. $\text{NaHCO}_3 + \text{HIO}_4 =$
- g. $\text{H}_2\text{S} + \text{KOH} =$
- h. $\text{Ba}(\text{OH})_2 + \text{H}_3\text{PO}_4 =$
- i. $\underline{\text{Mg}}(\text{OH})_2 + \text{H}_2\text{SO}_4 =$
- j. $\text{Al}_2(\text{SO}_4)_3 + 2 \text{NaOH} =$
- k. $\text{Fe}(\text{NO}_3)_3 + 2 \text{NaOH} =$
- l. $\text{NiSO}_4 + 2 \text{KOH} =$
- m. $\text{Na}_2\text{HAsO}_3 + \text{HCl} =$
- n. $\text{Mg}(\text{HCO}_3)_2 + 2 \text{NaOH} =$
- o. $\text{KCN} + \text{H}_2\text{CO}_3 =$
- p. $\text{H}_3\text{BO}_3 + \text{NaOH} =$

Solutions

1.

- a. $3 \text{NH}_3 + \text{H}_3\text{PO}_4 = (\text{NH}_4)_3\text{PO}_4$
- b. $\text{Al}_2\text{O}_3 + 3 \text{SiO}_2 = \text{Al}_2(\text{SiO}_3)_3$
- c. $2 \text{NaOH} + \text{H}_2\text{S} = \text{Na}_2\text{S} + 2 \text{H}_2\text{O}$
- d. $\text{SO}_2 + \text{Ba}(\text{OH})_2 = \underline{\text{BaSO}_3} + \text{H}_2\text{O}$
- e. $\text{N}_2\text{O}_5 + \text{Li}_2\text{O} = 2 \text{LiNO}_3$
- f. $\underline{\text{Zn}(\text{OH})_2} + \text{CO}_2 = \underline{\text{ZnCO}_3} + \text{H}_2\text{O}$
- g. $3 \text{H}_2\text{S} + 2 \text{Bi}(\text{NO}_3)_3 = 6 \text{HNO}_3 + \underline{\text{Bi}_2\text{S}_3}$
- h. $3 \text{Ca}(\text{OH})_2 + 2 \text{H}_3\text{AsO}_4 = \underline{\text{Ca}_3(\text{AsO}_4)_2} + 6 \text{H}_2\text{O}$
- i. $\underline{\text{Cd}(\text{OH})_2} + 2 \text{HClO}_4 = \text{Cd}(\text{ClO}_4)_2 + 2 \text{H}_2\text{O}$
- j. $\text{Cr}_2\text{O}_3 + \text{SO}_3 = \text{Cr}_2(\text{SO}_4)_3$

2.

- a. $\text{K}_2\text{SO}_4 + \text{H}_2\text{SO}_4 = 2 \text{KHSO}_4$
- b. $\underline{\text{CaHPO}_4} + \text{H}_3\text{PO}_4 = \text{Ca}(\text{H}_2\text{PO}_4)_2$
- c. $\underline{\text{Ba}_3(\text{PO}_4)_2} + 2 \text{H}_3\text{PO}_4 = \underline{2 \text{BaHPO}_4} + \text{Ba}(\text{H}_2\text{PO}_4)_2$
- d. $\text{Na}_3\text{PO}_4 + 2 \text{HI} = \text{NaH}_2\text{PO}_4 + 2 \text{NaI}$
- e. $\text{Na}_2\text{SO}_3 + \text{SO}_2 + \text{H}_2\text{O} = 2 \text{NaHSO}_3$
- f. $\text{NaHCO}_3 + \text{HIO}_4 = \text{H}_2\text{CO}_3 + \text{NaIO}_4$
- g. $\text{H}_2\text{S} + \text{KOH} = \text{KHS} + \text{H}_2\text{O}$
- h. $\text{Ba}(\text{OH})_2 + \text{H}_3\text{PO}_4 = \underline{\text{BaHPO}_4} + 2 \text{H}_2\text{O}$
- i. $\underline{\text{Mg}(\text{OH})_2} + \text{H}_2\text{SO}_4 = \text{MgSO}_4 + 2 \text{H}_2\text{O}$
- j. $\text{Al}_2(\text{SO}_4)_3 + 2 \text{NaOH} = 2 \text{Al}(\text{OH})\text{SO}_4 + \text{Na}_2\text{SO}_4$
- k. $\text{Fe}(\text{NO}_3)_3 + 2 \text{NaOH} = \text{Fe}(\text{OH})_2\text{NO}_3 + 2 \text{NaNO}_3$
- l. $\text{NiSO}_4 + 2 \text{KOH} = \underline{\text{Ni}(\text{OH})_2} + \text{K}_2\text{SO}_4$
- m. $\text{Na}_2\text{HAsO}_3 + \text{HCl} = \text{NaH}_2\text{AsO}_3 + \text{NaCl}$
- n. $\text{Mg}(\text{HCO}_3)_2 + 2 \text{NaOH} = \underline{\text{MgCO}_3} + \text{Na}_2\text{CO}_3 + 2 \text{H}_2\text{O}$
- o. $\text{KCN} + \text{H}_2\text{CO}_3 = \text{HCN} + \text{KHCO}_3$
- p. $\text{H}_3\text{BO}_3 + \text{NaOH} = \text{Na}[\text{B}(\text{OH})_4]$