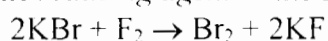


Due Monday February 25th at the beginning of class. Show all work to receive credit.

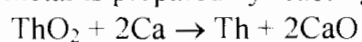
1. Name and give the formulas for six *strong acids*.

2. Determine the oxidation number of each of the elements in $\text{Cs}_2\text{Cr}_2\text{O}_7$?

3. Identify the *reducing agent* in the following reaction.



4. Thorium metal is prepared by reacting thorium oxide with calcium as depicted below.



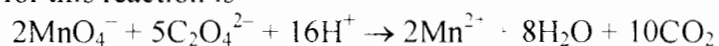
What is the *reducing agent* in this process? _____

What is oxidized in the process? _____

5. How many grams of potassium chloride are needed to make 3.0 liters of a 2.0 M KCl solution?

6. What volume of concentrated nitric acid (15.0 M) is required to make 100. mL of a 3.0 M nitric acid solution?

7. The concentration of oxalate ion ($\text{C}_2\text{O}_4^{2-}$) in a sample can be determined by titration with a solution of permanganate ion (MnO_4^-) of known concentration. The net ionic equation for this reaction is



A 30.00 mL sample of an oxalate solution is found to react completely with 21.93 mL of a 0.1725 M solution of MnO_4^- . What is the oxalate ion concentration in the sample?

8. What volume (mL) of a 0.2450 M $\text{KOH}(\text{aq})$ solution is required to completely neutralize 55.25 mL of a 0.5440 M $\text{H}_3\text{PO}_4(\text{aq})$ solution?

9. 34.62 mL of 0.1510 M NaOH was needed to neutralize 50.0 mL of an H_2SO_4 solution. What is the concentration of the original sulfuric acid solution?

10. A 110. mL solution of 0.340 M $\text{HCl}(\text{aq})$ is mixed with a solution of 330. mL of 0.150 M $\text{HNO}_3(\text{aq})$. The solution is then diluted to a final volume of 1.00 L. How many moles of H^+ are present in the final solution?