Balance each of these decomposition equations.

1. \(2 \text{HgO} \rightarrow 2 \text{Hg} + \text{O}_2\)

2. \(2 \text{RbCl} \rightarrow 2 \text{Rb} + \text{Cl}_2\)

3. \(2 \text{Cu}_2\text{O} \rightarrow 4 \text{Cu} + \text{O}_2\)

4. \(\text{Na}_2\text{CO}_3 \rightarrow \text{Na}_2\text{O} + \text{CO}_2\)

5. \(2 \text{H}_3\text{BO}_3 \rightarrow \text{B}_2\text{O}_3 + 3 \text{H}_2\text{O}\)

Write a complete, balanced chemical equation for each synthesis reaction. Include subscripts as needed. Don’t forget about the diatomic elements!

6. Solid lithium nitride decomposes into solid lithium and nitrogen gas.
   \[2 \text{Li}_3\text{N} \rightarrow 6 \text{Li} + \text{N}_2\]

7. Solid aluminum oxide decomposes into solid aluminum and oxygen gas.
   \[2 \text{Al}_2\text{O}_3 \rightarrow 4 \text{Al} + 3 \text{O}_2\]

8. A solution of sodium chlorate decomposes into solid sodium chloride and oxygen gas.
   \[2 \text{NaClO}_3 \rightarrow 2 \text{NaCl} + 3 \text{O}_2\]

9. A solution of nitric acid breaks down into solid dinitrogen pentaoxide and liquid water.
   \[2 \text{HNO}_3 \rightarrow \text{N}_2\text{O}_5 + \text{H}_2\text{O}\]

10. Solid nickel (II) chlorate decomposes into nickel (II) chloride and oxygen gas.
    \[\text{NiCl}_2(\text{ClO}_3)_2 \rightarrow \text{NiCl}_2 + 3 \text{O}_2\]

Predict the product made by the given reactants. Make sure the equation you write is balanced. Pay attention to Decomposition rules!

11. Magnesium hydroxide
    \[\text{Mg(OH)}_2 \rightarrow \text{H}_2\text{O} + \text{MgO}\]

12. Calcium sulfate
    \[\text{CaSO}_4 \rightarrow \text{CaO} + \text{SO}_3\]

13. Iron (III) oxide
    \[2 \text{Fe}_2\text{O}_3 \rightarrow 4 \text{Fe} + 3 \text{O}_2\]