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Balanced unbalanced forces worksheet answers

Answer key

LOHS Honors Chemistry
Balancing Chemical Equations

Part I: Balance these chemical equations. Record what type of reaction on the blank in the right margin.

1. $\text{BaCl}_2 + 2\text{KClO}_3 \rightarrow \text{Ba}(\text{ClO}_3)_2 + 2\text{KCl}$ DR
2. $\text{Pb}(\text{OH})_2 + \text{PbO} + \text{H}_2\text{O} \rightarrow \text{Pb}_3\text{O}_4$ D
3. $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$ SR
4. $\text{Pb}(\text{NO}_3)_2 + \text{K}_2\text{CrO}_4 \rightarrow \text{PbCrO}_4 + 2\text{KNO}_3$ DR
5. $\text{Al}_2(\text{SO}_4)_3 + 3\text{Ca}(\text{OH})_2 \rightarrow 2\text{Al}(\text{OH})_3 + 3\text{CaSO}_4$ DR
6. $\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$ SR
7. $\text{Sn} + 2\text{KOH} \rightarrow \text{K}_2\text{SnO}_3 + \text{H}_2$ SR
8. $2\text{PbI}_2 \rightarrow 2\text{Pb} + \text{I}_2$ D
9. $3\text{SiF}_4 + 3\text{H}_2\text{O} \rightarrow \text{H}_2\text{SiF}_6 + \text{H}_2\text{SiO}_3$ S
10. $\text{Cl}_2\text{O}_3 + \text{H}_2\text{O} \rightarrow 2\text{HClO}_3$ S
11. $\text{I}_2\text{Na} + \text{S}_8 \rightarrow 2\text{Na}_2\text{S}$ S
12. $\text{N}_2\text{O}_3 + \text{H}_2\text{O} \rightarrow 2\text{HNO}_3$ S

Part II: Write balanced chemical equations for each of the reactions below. Assume that all ionic compounds are dissolved in water (aqueous). Also be sure to include physical states where appropriate.

1. Iron metal combines with oxygen gas to form iron (III) oxide solid

$$4\text{Fe}(s) + 3\text{O}_2(g) \rightarrow 2\text{Fe}_2\text{O}_3(s)$$
2. Chromium metal and sulfuric acid (H_2SO_4) react to form chromium (III) sulfate solution and hydrogen gas.

$$2\text{Cr}(s) + 3\text{H}_2\text{SO}_4(aq) \xrightarrow{\quad} \text{Cr}_2(\text{SO}_4)_3(aq) + 3\text{H}_2(g)$$
3. Barium chromate solution and aqueous hydrochloric acid (HCl) react to produce barium chloride solution and hydrogen chromate (solid).

$$\text{BaCrO}_4(aq) + 2\text{HCl}(aq) \rightarrow \text{BaCl}_2(aq) + \text{H}_2\text{CrO}_4(s)$$

3) Assume that the wheels of the car apply 10 N of force forward. Add a force arrow to the picture showing this situation. What is the combined force (net force) if friction and drag are negligible?

Now assume that a parachute opens that applies 7 N of force in the other direction opposite to the 10 N of force still being applied by the wheels. Add force arrows to the picture showing this situation. What is the new combined force (net force) and direction?

A rocket applies an additional force of 10 Newtons to the 10 Newtons that are applied by the wheels. Add force arrows to the picture assuming that the parachute continues to apply 7 N of force in the opposite direction. What is the new combined force (net force) and direction?

4) 

Flight condition	Effect
Lift > Weight	Plane Rises
Weight > Lift	Plane Falls
Drag > Thrust	Plane Slows
Thrust > Drag	Plane Accelerates

An airplane has a weight of 100,000 N and a lift force of 75,000 N.

- (a) What is the combined force (net force) on the airplane? _____
- (b) Are the forces balanced or unbalanced? _____
- (c) What will happen to the plane? _____

An airplane has a thrusting force of 200,000 N and a drag force of 23,000 N.

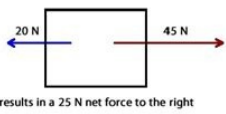
- (d) What is the combined force (net force) on the airplane? _____
- (e) Are the forces balanced or unbalanced? _____
- (f) What will happen to the plane? _____

Balancing Equations

1. $\underline{\hspace{1cm}} \text{H}_2 + \underline{\hspace{1cm}} \text{O}_2 \Rightarrow \underline{\hspace{1cm}} \text{H}_2\text{O}$
2. $\underline{\hspace{1cm}} \text{H}_3\text{PO}_4 + \underline{\hspace{1cm}} \text{KOH} \Rightarrow \underline{\hspace{1cm}} \text{K}_3\text{PO}_4 + \underline{\hspace{1cm}} \text{H}_2\text{O}$
3. $\underline{\hspace{1cm}} \text{K} + \underline{\hspace{1cm}} \text{B}_2\text{O}_3 \Rightarrow \underline{\hspace{1cm}} \text{K}_2\text{O} + \underline{\hspace{1cm}} \text{B}$
4. $\underline{\hspace{1cm}} \text{HCl} + \underline{\hspace{1cm}} \text{NaOH} \Rightarrow \underline{\hspace{1cm}} \text{NaCl} + \underline{\hspace{1cm}} \text{H}_2\text{O}$
5. $\underline{\hspace{1cm}} \text{Na} + \underline{\hspace{1cm}} \text{NaNO}_3 \Rightarrow \underline{\hspace{1cm}} \text{Na}_2\text{O} + \underline{\hspace{1cm}} \text{N}_2$
6. $\underline{\hspace{1cm}} \text{C} + \underline{\hspace{1cm}} \text{S}_8 \Rightarrow \underline{\hspace{1cm}} \text{CS}_2$
7. $\underline{\hspace{1cm}} \text{Na} + \underline{\hspace{1cm}} \text{O}_2 \Rightarrow \underline{\hspace{1cm}} \text{Na}_2\text{O}_2$
8. $\underline{\hspace{1cm}} \text{N}_2 + \underline{\hspace{1cm}} \text{O}_2 \Rightarrow \underline{\hspace{1cm}} \text{N}_2\text{O}_5$
9. $\underline{\hspace{1cm}} \text{H}_3\text{PO}_4 + \underline{\hspace{1cm}} \text{Mg}(\text{OH})_2 \Rightarrow \underline{\hspace{1cm}} \text{Mg}_3(\text{PO}_4)_2 + \underline{\hspace{1cm}} \text{H}_2\text{O}$
10. $\underline{\hspace{1cm}} \text{NaOH} + \underline{\hspace{1cm}} \text{H}_2\text{CO}_3 \Rightarrow \underline{\hspace{1cm}} \text{Na}_2\text{CO}_3 + \underline{\hspace{1cm}} \text{H}_2\text{O}$
11. $\underline{\hspace{1cm}} \text{KOH} + \underline{\hspace{1cm}} \text{HBr} \Rightarrow \underline{\hspace{1cm}} \text{KBr} + \underline{\hspace{1cm}} \text{H}_2\text{O}$
12. $\underline{\hspace{1cm}} \text{H}_2 + \underline{\hspace{1cm}} \text{O}_2 \Rightarrow \underline{\hspace{1cm}} \text{H}_2\text{O}_2$
13. $\underline{\hspace{1cm}} \text{Na} + \underline{\hspace{1cm}} \text{O}_2 \Rightarrow \underline{\hspace{1cm}} \text{Na}_2\text{O}$
14. $\underline{\hspace{1cm}} \text{Al}(\text{OH})_3 + \underline{\hspace{1cm}} \text{H}_2\text{CO}_3 \Rightarrow \underline{\hspace{1cm}} \text{Al}_2(\text{CO}_3)_3 + \underline{\hspace{1cm}} \text{H}_2\text{O}$
15. $\underline{\hspace{1cm}} \text{Al} + \underline{\hspace{1cm}} \text{S}_8 \Rightarrow \underline{\hspace{1cm}} \text{Al}_2\text{S}_3$
16. $\underline{\hspace{1cm}} \text{Cs} + \underline{\hspace{1cm}} \text{N}_2 \Rightarrow \underline{\hspace{1cm}} \text{Cs}_3\text{N}$
17. $\underline{\hspace{1cm}} \text{Mg} + \underline{\hspace{1cm}} \text{Cl}_2 \Rightarrow \underline{\hspace{1cm}} \text{MgCl}_2$
18. $\underline{\hspace{1cm}} \text{Rb} + \underline{\hspace{1cm}} \text{RbNO}_3 \Rightarrow \underline{\hspace{1cm}} \text{Rb}_2\text{O} + \underline{\hspace{1cm}} \text{N}_2$
19. $\underline{\hspace{1cm}} \text{C}_6\text{H}_6 + \underline{\hspace{1cm}} \text{O}_2 \Rightarrow \underline{\hspace{1cm}} \text{CO}_2 + \underline{\hspace{1cm}} \text{H}_2\text{O}$
20. $\underline{\hspace{1cm}} \text{N}_2 + \underline{\hspace{1cm}} \text{H}_2 \Rightarrow \underline{\hspace{1cm}} \text{NH}_3$

Balanced and Unbalanced Forces

- Draw a free body diagram with two forces in opposite directions that would result in a net force (and acceleration)



TYPES OF FORCES PRACTICE PROBLEMS

- A. Students know the definition of different types of forces.
B. Students will find the net force and describe the magnitude and direction of the net force.
C. Students will describe the different types of forces and how it affects the object's motion.

1. _____ is a type of force that a person or machine exerts (pushes or pulls) on an object that may cause a change in the velocity of an object.

- or weight is defined as the force of attraction between the Earth and all objects that are on Earth due to their masses. The two factors that affect this force are mass and the distance.

4. _____ is a force that acts in the opposite direction of a car moving (brake) or moving (climb) object. This force can cause an object to slow down and stop.

7. _____ is inserted when a spring scale operation or compressors scale
is subject to attachment to its

