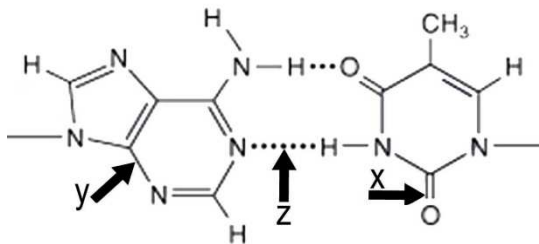


## Chemistry Review Worksheet

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1. The following represents what type of bonds?



- x. Double covalent bond
- y. Single covalent bond
- z. Hydrogen bond

2. Indicate whether these reactions are endergonic or exergonic?

- a.  $A + B \rightarrow C + \text{energy}$  **exergonic**
- b.  $D + E + \text{energy} \rightarrow F$  **endergonic**
- c. a reaction in which energy is released **exergonic**
- d. a reaction in which the reactants have more energy than the products **exergonic**
- e. a reaction in which the products have more energy than the reactants **endergonic**
- f. a reaction in which energy must be added **endergonic**
- g.  $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O} + 213 \text{ kcal}$  **exergonic**
- h.  $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + 38\text{ATP}$  **exergonic**
- i.  $\text{glucose} + \text{galactose} + \text{energy} \rightarrow \text{lactose} + \text{water}$  **endergonic**
- j.  $2\text{Al} + \text{Fe}_2\text{O}_3 \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe} + 204 \text{ kcal}$  **exergonic**
- k.  $\text{PCl}_5 + 16 \text{ kcal} \rightarrow \text{PCl}_3 + \text{Cl}_2$  **endergonic**
- l.  $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl} + \text{energy}$  **exergonic**
- m.  $2\text{H}_2\text{O} + \text{energy} \rightarrow 2\text{H}_2 + \text{O}_2$  **endergonic**

kcal = **kilocalories**, a measure of heat energy

ATP = acronym for a special energy carrying molecule **Adenosine Triphosphate**

3. In these reactions, is the first chemical oxidized or reduced?

- a.  $\text{Cl} \rightarrow \text{Cl}^-$       **reduced**
- b.  $\text{Na} \rightarrow \text{Na}^+$       **oxidized**
- c.  $\text{Zn}^{2+} \rightarrow \text{Zn}$       **reduced**
- d.  $\text{Cu}^+ \rightarrow \text{Cu}^{2+}$       **oxidized**
- e.  $\text{Fe}^{3+} \rightarrow \text{Fe}^{2+}$       **reduced**
- f.  $\text{P} \rightarrow \text{P}^{3-}$       **reduced**
- g.  $\text{Ca} \rightarrow \text{Ca}^{2+}$       **oxidized**
- h.  $\text{Pb}^{2+} \rightarrow \text{Pb}^{4+}$       **oxidized**
- i.  $2\text{H}^+ \rightarrow \text{H}_2$       **reduced**
- j.  $2\text{O}^{2-} \rightarrow \text{O}_2$       **oxidized**
- k.  $\text{NAD}^+ \rightarrow \text{NADH}$       **reduced**
- l.  $\text{C}_2\text{H}_6\text{O} \rightarrow \text{C}_2\text{H}_4\text{O}$       **oxidized**
- m.  $\text{FADH}_2 \rightarrow \text{FAD}$       **oxidized**
- n.  $\text{Q} \rightarrow \text{QH}_2$       **reduced**

NAD = the acronym for a special electron carrier molecule **N**icotinamide **A**denine **D**inucleotide

NADH = **N**icotinamide **A**denine **D**inucleotide with **H**ydrogen added

FAD = the acronym for a special electron carrier molecule **F**lavin **A**denine **D**inucleotide

FADH<sub>2</sub> = **F**lavin **A**denine **D**inucleotide with two (**2**) **H**ydrogens added

Q = a special electron carrier molecule **Q**uinone

QH<sub>2</sub> = **Q**uinone with two (**2**) **H**ydrogens added

4. In these reactions, which chemical is oxidized and which chemical is reduced?

- a.  $\text{Na} + \text{Cl} \rightarrow \text{Na}^+ + \text{Cl}^-$       **ox = Na, red = Cl**
- b.  $\text{Zn} + \text{Cu}^{2+} \rightarrow \text{Zn}^{2+} + \text{Cu}$       **ox = Zn, red = Cu<sup>2+</sup>**
- c.  $2\text{Al} + 6\text{H}^+ \rightarrow 2\text{Al}^{3+} + 3\text{H}_2$       **ox = Al, red = H<sup>+</sup>**
- d.  $\text{FADH}_2 + \text{Q} \rightarrow \text{FAD} + \text{QH}_2$       **ox = FADH<sub>2</sub>, red = Q**
- e.  $\text{C}_3\text{H}_4\text{O}_3 + (\text{NADH} + \text{H}^+) \rightarrow \text{C}_3\text{H}_6\text{O}_3 + \text{NAD}^+$       **ox = NADH, red = C<sub>3</sub>H<sub>4</sub>O<sub>3</sub>**
- f.  $\text{Fe} + \text{S} \rightarrow \text{Fe}^{2+} + \text{S}^{2-}$       **ox = Fe, red = S**
- g.  $2\text{Ag}^+ + 2\text{Br}^- \rightarrow 2\text{Ag} + \text{Br}_2$       **ox = Br<sup>-</sup>, red = Ag<sup>+</sup>**
- h.  $\text{Li}^+ + \text{K} \rightarrow \text{Li} + \text{K}^+$       **ox = K, red = Li<sup>+</sup>**
- i.  $\text{C}_4\text{H}_6\text{O}_4 + \text{FAD} \rightarrow \text{C}_4\text{H}_4\text{O}_4 + \text{FADH}_2$       **ox = C<sub>4</sub>H<sub>6</sub>O<sub>4</sub>, red = FAD**