

Assignment Preview

practice test 2

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About this assignment

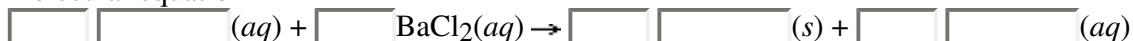
practice test 2

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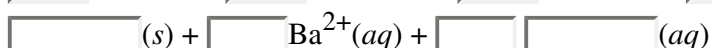
1. ZumChem5 4.AE.071. [224611] Write the balanced molecular equations, complete ionic equations, and net ionic equations for the following reactions. (Type your answer using the format $[\text{NH}_4]^+$ for NH_4^+ and $[\text{Ni}(\text{CN})_4]^{2-}$ for $\text{Ni}(\text{CN})_4^{2-}$. Use the lowest possible coefficients. If no reaction occurs, type "NR" into all the answer boxes for that reaction.)

(a) silver nitrate + barium chloride \rightarrow

molecular equation



complete ionic equation

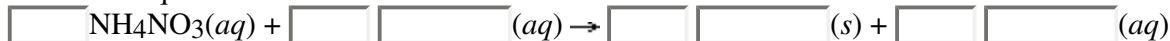


net ionic equation



(b) ammonium nitrate + potassium chloride \rightarrow

molecular equation



complete ionic equation

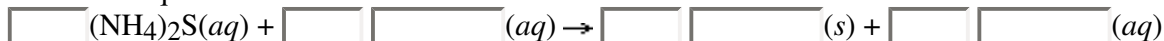


net ionic equation



(c) ammonium sulfide + iron(II) chloride \rightarrow

molecular equation



complete ionic equation

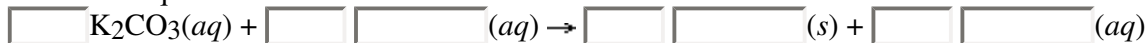


net ionic equation

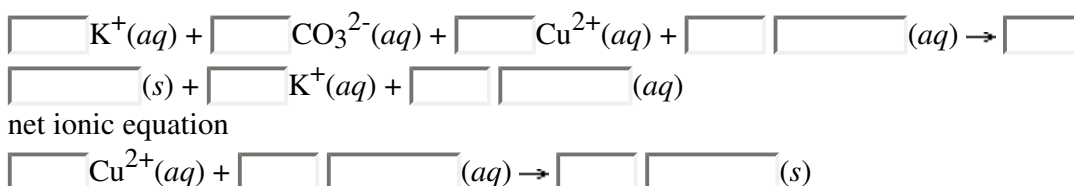


(d) potassium carbonate + copper(II) sulfate \rightarrow

molecular equation



complete ionic equation



2. ZumChem5 6.AE.083. [224734] The combustion of **0.1531** g benzoic acid increases the temperature of a bomb calorimeter by **2.57**°C. Calculate the heat capacity of this calorimeter. (The energy released by combustion of benzoic acid is 26.42 kJ/g.)

kJ/°C

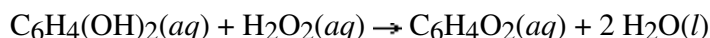
A **0.2010** g sample of vanillin (C₈H₈O₃) is then burned in the same calorimeter, and the temperature increases by **3.33**°C. What is the energy of combustion per gram of vanillin?

kJ/g

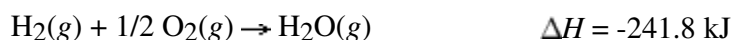
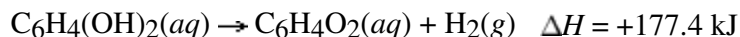
What is the energy of combustion per mole of vanillin?

kJ/mol

3. ZumChem5 6.E.056. [224765] The bombardier beetle uses an explosive discharge as a defensive measure. The chemical reaction involved is the oxidation of hydroquinone by hydrogen peroxide to produce quinone and water.



Calculate ΔH for the above reaction from the following data.



kJ

4. ZumChem5 7.E.100. [224821] Which would have the more negative electron affinity, the **bromine** atom or the **Br⁻** ion?

bromine

Br⁻

Explain.



5. ZumChem5 7.E.096. [224819] For each of the given pairs of elements, pick the atom with the following characteristics.

(Mg and K)

(a) more favorable (exothermic) electron affinity

K

Mg

(b) higher ionization energy

K

Mg

(c) larger size

K

Mg

(F and Cl)

(a) more favorable (exothermic) electron affinity

Cl

F

(b) higher ionization energy

Cl

F

(c) larger size

Cl

F

6. ZumChem5 7.E.088. [224817] In each of the following sets, which atom or ion has the smallest ionization energy?

(a) Cs, Ba, La

Cs

La

Ba

(b) Zn, Ga, Ge

- Zn
- Ga
- Ge
- (c) In, P, Ar
 - In
 - P
 - Ar
- (d) Tl, Sn, As
 - Tl
 - As
 - Sn
- (e) O, O⁻, O²⁻
 - O
 - O⁻
 - O²⁻

7. ZumChem5 7.AE.120. [224782] An ion having a 4+ charge and a mass of 49.9 amu has 2 electrons with principal quantum number $n = 1$, 8 electrons with $n = 2$, and 10 electrons with $n = 3$. Supply as many of the properties for the ion as possible from the information given. (Hint: In forming ions, the 4s electrons are lost before the 3d electrons.)

- (a) What is the atomic number?
 - 16
 - 20
 - 22
 - 24
- (b) What is the total number of s electrons?
 - 2
 - 4
 - 6
 - 8
- (c) What is the total number of p electrons?
 - 8
 - 10
 - 12
 - 16
- (d) What is the total number of d electrons?
 - 0
 - 2
 - 4
 - 6
- (e) What is the number of neutrons in the nucleus?
 - 20
 - 24
 - 26

28

(f) What is the ground-state electron configuration of the neutral atom?

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^6$

$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$

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