

This print-out should have 40 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001 10.0 points

Calculate the number of H₂O molecules in 1.00 cm³ of water at 0°C (density = 0.99987 g/cm³).

1. 8.36×10^{24} molec
2. 1.55×10^{23} molec
3. 6.69×10^{22} molec
4. 3.35×10^{22} molec

002 10.0 points

How many moles of hydrogen are contained in 3.00 moles of ethanol (CH₃CH₂OH)?

1. $3.00 \times 6.02 \times 10^{23}$ mol
2. $3.00 \times 3.61 \times 10^{24}$ mol
3. 3.61×10^{24} mol
4. 6.02×10^{23} mol
5. 18.00 mol
6. 3.00×10^{23} mol
7. 3.00 mol
8. 1.00×10^{23} mol
9. 1.00 mol
10. 6.00 mol

003 10.0 points

Find the molar mass for (NH₄)₂CrO₄.

1. 168.10 g/mol
2. 110.13 g/mol

3. 136.10 g/mol

4. 142.20 g/mol

5. 152.10 g/mol

004 10.0 points

What is the weight of a single molecule of CO₂?

1. 6.0×10^{-23} g

2. 44 g

3. 7.31×10^{-23} g

4. 6.0×10^{23} g

5. 7.31×10^{23} g

005 10.0 points

What is the percent carbon by weight in a pure sample of C₂H₄O₂?

1. 40%

2. 30%

3. 25%

4. 10%

5. 20%

006 10.0 points

A compound consists of 65.45% C, 5.492% H, and 29.06% O on a mass basis and has a molar mass of 110 g/mol. Determine the molecular formula of the compound.

1. CHO

2. C₅H₅O₂

3. C₃H₃O

4. C₆H₆O₂

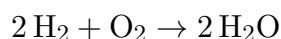
007 10.0 points

A compound is found to contain 53.70% iron and 46.30% sulfur. Find its empirical formula.

1. Fe₂S
2. FeS
3. Fe₂S₃
4. Fe₂S₅

008 10.0 points

Given the balanced formula

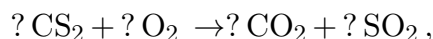


for the combustion of hydrogen molecules with oxygen molecules, which ratio of hydrogen to oxygen would you expect to produce the loudest bang?

1. 1 mol H₂ : 1 mol O₂
2. 1 mol H₂ : 2 mol O₂
3. 2 mol H₂ : 2 mol O₂
4. 3 mol H₂ : 1 mol O₂
5. 0 mol H₂ : 3 mol O₂
6. 2 mol H₂ : 1 mol O₂

009 10.0 points

Balance the equation



using the smallest possible integers. The coefficient of O₂ is

1. 1.
2. 5.
3. 2.
4. 4.
5. 3.

010 10.0 points

Ethylene (C₂H₄) burns in oxygen to produce carbon dioxide and water. The correct form of the chemical equation that describes this reaction is

1. C₂H₄ + 2O₂ → 2 CO + 2 H₂O.
2. C₂H₄ + O₂ → CO₂ + H₂O.
3. 2 C₂H₄ + O₂ → 2 CO₂ + H₂O.
4. C₂H₄ + 3 O₂ → 2 CO₂ + 2 H₂O.

011 10.0 points

For the reaction

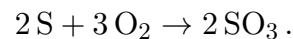


what mass of NH₃ is needed to react with 21 grams of CH₃OH?

1. 1.3 g
2. 22.3 g
3. 710 g
4. 11 g

012 10.0 points

60.0 g O₂ and 50.0 g S are reacted according to the equation

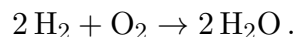


Which reactant is in excess and by how many grams?

1. S; 24.8 g
2. O₂; 24.8 g
3. O₂; 10.0 g
4. S; 20.0 g
5. S; 10.0 g
6. O₂; 20.0 g

013 10.0 points

Consider the reaction



How much water will be formed when 32 grams of hydrogen and 32 grams of oxygen are mixed and allowed to react?

1. 36 g

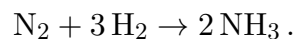
2. 64 g

3. 2.0 g

4. 18 g

014 10.0 points

Consider the reaction

14.0 moles of N_2 and 48.0 moles of H_2 are reacted, producing 21.5 moles of NH_3 . What is the percent yield?

1. 76.8%

2. 148.8%

3. 130.2%

4. 29.9%

5. 67.2%

6. Not enough information is given.

7. 100.0%

015 10.0 pointsHow much of a 4.45 M CaBr_2 solution can be prepared if one has 79.6 g of CaBr_2 available?

1. 1.00 L

2. 0.0356 L

3. 0.115 L

4. 1.77 L

5. 1.65 L

6. 0.564 L

7. 0.0895 L

8. 3.54 L

016 10.0 points

What is the molarity of a solution prepared by dissolving 19.8 g of glucose (of MW 180 amu) in 115 mL of solution?

1. 0.00096 M

2. 172.2 M

3. 0.96 M

4. 0.172 M

017 10.0 points

How many mL of 12.0 M HCl are needed to make 2.0 L of 0.40 M HCl solution?

1. 420 mL

2. 17 mL

3. 15 mL

4. 96 mL

5. 67 mL

018 10.0 points

If 200 mL of water is evaporated from 400 mL of 0.5 M aqueous salt solution, what is the resulting concentration?

1. 2.5×10^{-1} M2. 2.5×10^0 M

3. None of these

4. 2.5×10^1 M

5. 2.5×10^{-2} M

019 10.0 points

The oxidation numbers of nitrogen in NH_3 , NO_3^- and NO are

- +3, +6, and +2, respectively.
- 3, +5, and +1, respectively.
- 3, +5, and +2, respectively.
- 3, +6, and +2, respectively.

020 10.0 points

Calculate the oxidation numbers for each element in RbO .

- Rb = 0, O = 0
- Rb = +3, O = -2
- Rb = +2, O = -2
- Rb = +1, O = -2
- Rb = +1, O = -1

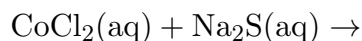
021 10.0 points

Which of the displacement reactions below occurs as written (don't worry about balancing)?

- $\text{Fe}^{3+} + \text{Ag} \rightarrow \text{Fe} + \text{Ag}^+$
- $\text{Fe}^{3+} + \text{Mg} \rightarrow \text{Fe} + \text{Mg}^{2+}$
- $\text{Na}^+ + \text{Zn} \rightarrow \text{Na} + \text{Zn}^{2+}$
- $\text{Ca}^{2+} + \text{Au} \rightarrow \text{Ca} + \text{Au}^+$
- None of the reactions occurs as written.

022 10.0 points

Identify the solid product that forms when the following aqueous solutions are mixed:



- CoS and NaCl
- No solid products are formed.
- CoS and 2NaCl
- NaCl
- CoS

023 10.0 points

Which of the following is best described as an acid-base reaction?

- $2\text{HgO} \rightarrow 2\text{Hg} + \text{O}_2$
- $\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$
- $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{NaNO}_3 + \text{AgCl}$
- $\text{NH}_3 + \text{H}_2\text{O} \rightarrow \text{NH}_4^+ + \text{OH}^-$
- $\text{KCl} + \text{NH}_4\text{NO}_3 \rightarrow \text{KNO}_3 + \text{NH}_4\text{Cl}$

024 10.0 points

The observed product from the reaction of FeCl_2 and K_2CO_3 is

- There is no reaction.
- KCl electrolyte.
- CO_2 gas.
- FeCO_3 precipitate.
- Cl_2 gas.

025 10.0 points

Zn is an active metal above H on the activity series. When zinc is placed in an acidic solution one of the products produced is

- There is no reaction because Zn is above H .
- H_2 .

3. H₂O.
4. Zn(OH)₂.

026 10.0 points

Which of the following aqueous solutions should form a precipitate with aqueous Fe(NO₃)₃?

1. K₂SO₄
2. KCl
3. KOH
4. KNO₃

027 10.0 points

Which aqueous solution should form a precipitate with aqueous Cu(NO₃)₂?

1. K₂SO₄
2. KNO₃
3. K₂S
4. CuSO₄

028 10.0 points

Choose the pair of names and formulas that do not match.

1. NaNO₃ : sodium nitrate
2. MgSO₃ : magnesium sulfate
3. SiCl₄ : silicon tetrachloride
4. N₂O₃ : dinitrogen trioxide
5. SnCl₄ : stannic chloride

029 10.0 points

Name the compound K₂CO₃.

1. potassium carbide

2. potassium(II) carbonate
3. potassium carboxide
4. potassium carbonate

030 10.0 points

Write the correct formula for ammonium phosphate.

1. (3NH₄)PO₄
2. (NH₄)₃PO₄
3. NH₄PO₄
4. NH₄(PO₄)₃

031 10.0 points

What is the name of the compound with the formula CCl₄?

1. carbon chloride
2. carbon(IV) chloride
3. carbon tetrachloride
4. chlorine carbonide

032 10.0 points

The correct name for the compound AgBrO₃ is

1. silver perbromate.
2. gold bromite.
3. silver bromoxide.
4. argon oxybromide.
5. silver bromate.

033 10.0 points

Choose the formula for the compound nitrous acid.

1. HNO₄

2. HN
3. HNO₃
4. HNO
5. HNO₂
6. H₂NO₃
7. H₂NO₂
8. H₃N

034 10.0 points

How many fluorine atoms are in 4.0 moles of fluorine molecules?

1. 1.5×10^{23} atoms
2. 4.8×10^{24} atoms
3. 6.6×10^{-24} atoms
4. 2.4×10^{24} atoms

035 10.0 points

Name the compound SO₃.

1. sulfite
2. sulfate
3. sulfur trioxide
4. sulfur oxide
5. sulfur(VI) oxide

036 10.0 points

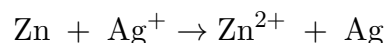
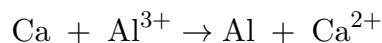
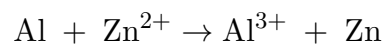
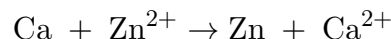
Name the compound Na₂O.

1. sodium(I) oxide
2. sodium peroxide
3. disodium monoxide

4. sodium oxide
5. sodium(II) oxide

037 10.0 points

The following reactions are observed to take place in aqueous solution, and the reverse reactions do not occur.



Which of the following lists the metals from most reactive to least reactive?

1. Zn; Ag; Al; Ca
2. Ag; Al; Ca; Zn
3. Ca; Al; Zn; Ag
4. Al; Zn; Ag; Ca

038 10.0 points

How many moles of the element carbon are in 10 moles of the compound benzene (C₆H₆)?

1. 60 mol
2. 12 mol
3. 10 mol
4. 1 mol
5. 0 mol

039 10.0 points

The name for KC₂H₃O₂ is

1. potassium(I) carbon hydroxide.
2. potassium acetate.
3. potassium oxalate.
4. potassium(I) acetate.

040 10.0 points

Of the four compounds

HF, HClO₂, NaOH, Ba(OH)₂

which are either strong acids or strong bases
in water?

1. All are either strong acids or strong bases.
2. NaOH
3. HClO₂ and NaOH
4. None are strong acids nor strong bases.
5. NaOH and Ba(OH)₂