

This print-out should have 20 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering. The due time is Central time.

Brodbelt 1020041

07:01, general, multiple choice, < 1 min, fixed.

001

A variety of ions including Na^+ , K^+ , NH_4^+ , Pb^{2+} , Fe^{2+} , NO_3^- , Cl^- , Br^- , S^{2-} , and CO_3^{2-} are mixed in a beaker of water. If you analyzed the precipitates, which substances would you expect to find?

1. NaNO_3 and K_2S
2. FeCl_2 and KCl
3. FeS and Na_2CO_3
4. FeCO_3 and KNO_3
5. PbS and FeCO_3
6. PbCO_3 and NaCl
7. NaBr and $\text{Pb}(\text{NO}_3)_2$

CIC T05 38

07:01, general, multiple choice, < 1 min, fixed.

002

Which compound is INSOLUBLE in water?

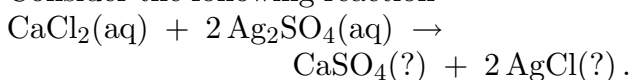
1. sodium carbonate
2. potassium nitrate
3. ammonium chloride
4. calcium carbonate

Mlib 01 4011

07:01, general, multiple choice, > 1 min, fixed.

003

Consider the following reaction



Which of the following statements is true?

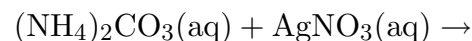
1. CaSO_4 will precipitate from solution, but AgCl will not.
2. AgCl will precipitate from solution, but CaSO_4 will not.
3. Both CaSO_4 and AgCl will precipitate from solution.
4. Neither CaSO_4 nor AgCl will precipitate from solution.

DAL 04 09

07:06, general, multiple choice, < 1 min, fixed.

004

Identify the solid product or products that form when the following aqueous solutions are mixed:



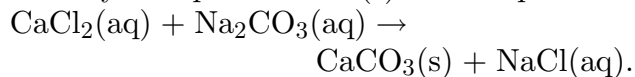
1. Ag_2CO_3
2. NH_4NO_3
3. Ag_2CO_3 and NH_4NO_3
4. No solid products are formed.

Mlib 01 4005

07:06, general, multiple choice, > 1 min, fixed.

005

Identify the spectator ion(s) in the equation



1. Ca^{2+} , Cl^-
2. Ca^{2+} , CO_3^{2-}
3. Na^+ , Cl^-
4. Na^+ , CO_3^{2-}

Mlib 75 0159

07:06, general, multiple choice, > 1 min, fixed.

006

What, if anything, is precipitated when aqueous solutions of LiOH and Sr(NO₃)₂ are mixed?

1. Nothing precipitates.
2. only Sr(OH)₂
3. both LiNO₃ and Sr(OH)₂
4. only LiNO₃

Mlib 01 3077

07:06, general, multiple choice, > 1 min, fixed.

007

Write the net ionic equation for the following reaction: Aqueous solutions of copper(II) nitrate and sodium hydroxide are mixed to form solid copper(II) hydroxide and aqueous sodium nitrate.

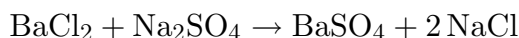
1. $\text{Cu}^{2+} + 2\text{OH}^- \rightarrow \text{Cu}(\text{OH})_2(\text{s})$
2. $\text{Cu}(\text{NO}_3)_2(\text{aq}) + 2\text{NaOH}(\text{aq}) \rightarrow \text{Cu}(\text{OH})_2(\text{s}) + 2\text{NaNO}_3(\text{aq})$
3. $\text{Cu}^{2+} + 2\text{NO}_3^- + 2\text{Na}^+ + 2\text{OH}^- \rightarrow \text{Cu}^{2+} + 2\text{OH}^- + 2\text{Na}^+ + 2\text{NO}_3^-$
4. $2\text{Na}^+ + 2\text{NO}_3^- \rightarrow 2\text{NaNO}_3(\text{aq})$

Mlib 01 4013

07:06, general, multiple choice, > 1 min, fixed.

008

Give the net ionic equation for the reaction



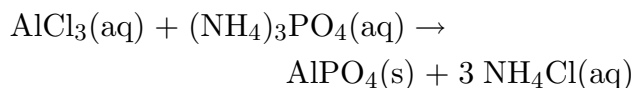
1. $\text{Ba}^{2+} + 2\text{Cl}^- + 2\text{Na}^+ + \text{SO}_4^{2-} \rightarrow \text{BaSO}_4(\text{s}) + 2\text{NaCl}$
2. $\text{Ba}^{2+} + \text{SO}_4^{2-} \rightarrow \text{BaSO}_4$
3. $2\text{Na}^+ + 2\text{Cl}^- \rightarrow 2\text{NaCl}$

Msci 04 0302

07:06, general, multiple choice, > 1 min, fixed.

009

In the equation



identify the spectator ion(s) for the reaction.

1. NH₄⁺, Cl⁻
2. Al³⁺, PO₄³⁻
3. NH₄⁺, Cl⁻, Al³⁺, PO₄³⁻
4. Al³⁺, NH₄⁺
5. NH₄⁺ only

Sparks eq net 004

07:06, general, multiple choice, < 1 min, fixed.

010

Write the net ionic equation for this reaction occurring in water: Calcium sulfide and iron(II) bromide are mixed to form iron(II) sulfide and calcium bromide.

1. $\text{S}^{2-} + \text{Fe}^{2+} \rightarrow \text{FeS}$
2. No reaction occurs.
3. $\text{Sr}^{2+} + \text{S}^{2-} + \text{Fe}^{2+} + 2\text{Br}^- \rightarrow \text{FeS} + \text{CaBr}_2$
4. $\text{S}^{2-} + \text{FeBr}_2 \rightarrow \text{FeS} + 2\text{Br}^-$
5. $\text{CaS} + 2\text{Br}^- \rightarrow \text{S}^{2-} + \text{CaBr}_2$
6. $\text{Ca}^{2+} + 2\text{Br}^- \rightarrow \text{CaBr}_2$

Sparks eq net 001

07:06, general, multiple choice, < 1 min, fixed.

011

Write the net ionic equation for this reaction occurring in water: Sodium phosphate and calcium chloride are mixed to form sodium chloride and calcium phosphate.

- $2\text{PO}_4^{3-} + 3\text{Ca}^{2+} \rightarrow \text{Ca}_3(\text{PO}_4)_2$
- No reaction occurs.
- $2\text{PO}_4^{3-} + 3\text{CaCl}_2 \rightarrow 6\text{Cl}^- + \text{Ca}_3(\text{PO}_4)_2$
- $2\text{Na}_3\text{PO}_4 + 3\text{Ca}^{2+} \rightarrow 6\text{Na}^+ + \text{Ca}_3(\text{PO}_4)_2$
- $\text{PO}_4^{2-} + \text{Ca}^{2+} \rightarrow \text{CaPO}_4$

Broadbelt 417

07:02, general, multiple choice, < 1 min, fixed.

012

Which of the following substances would likely create the most conductive solution?

- a weak acid
- a weak base
- a strong acid
- a weak electrolyte
- an insoluble salt
- an inert gas
- an ideal gas

Msci 04 0260

07:02, general, multiple choice, > 1 min, fixed.

013

An electrolyte

- is always derived from ionic compounds.
 - conducts an electric current in an aqueous solution.
 - never comes from molecular compounds.
 - All of these
-

Mlib 04 5049

18:03, general, multiple choice, > 1 min, fixed.

014What is the boiling point of a 0.800 molal solution of sugar in water? $K_b = 0.512^\circ\text{C}/m$ for water. Sugar does not dissociate in solution and pure water boils at 100°C .

- 0.41°C
- 100.82°C
- 99.59°C
- 100.41°C
- 100.00°C

Mlib 04 5003

18:03, general, multiple choice, > 1 min, fixed.

01530.2 g of glycerine ($\text{C}_3\text{H}_8\text{O}_3$) are dissolved in 150 g of water. What is the boiling point of the solution? (K_b of water = $0.515^\circ\text{C}/m$)

- 1.13°C
- 103.52°C
- 100.10°C
- 0.104°C
- 101.13°C

ChemPrin3e T08 68

18:04, general, multiple choice, < 1 min, fixed.

016The freezing point of seawater is about -1.85°C . If seawater is an aqueous solution of sodium chloride, calculate the molality of seawater. The k_f for water is $1.86\text{ K}/m$.

- 1.99 m
- 0.995 m
- 3.44 m

4. 3.70 *m*

5. 0.497 *m*

Msci 14 1200

18:04, general, multiple choice, > 1 min, fixed.

017

We observe the freezing points of four different aqueous solutions as follows:

- Solution A freezes at -0.10°C ;
- Solution B freezes at -4.00°C ;
- Solution C freezes at -10.00°C ; and
- Solution D freezes at -13.00°C .

In each solution, the solute is a non-volatile non-electrolyte. Which solution should be expected to have the highest boiling point?

1. Solution A
2. Solution B
3. Solution C
4. Solution D

Mlib 04 5035

18:04, general, multiple choice, > 1 min, fixed.

018

The molal freezing point depression constant for water is $1.86^{\circ}\text{C}/m$. A water solution that is 0.50 molal in sugar would freeze at

1. -1.86°C
2. 1.86°C
3. -9.30°C
4. -3.72°C
5. -0.93°C

Mlib 04 5063

18:04, general, multiple choice, > 1 min, fixed.

019

When 20.0 grams of an unknown compound are dissolved in 500 grams of benzene, the

freezing point of the resulting solution is 3.77°C . The freezing point of pure benzene is 5.48°C , and its freezing point depression constant is $K_f = 5.12^{\circ}\text{C}/\text{molality}$. What is the molecular weight of the unknown compound?

1. 120 grams/mole
2. 80.0 grams/mole
3. 100 grams/mole
4. 140 grams/mole
5. 160 grams/mole

Molar Mass 08 59

18:03, general, numeric, > 1 min, normal.

020

A 1.05 g sample of a molecular compound is dissolved in 100 g of tetrachloromethane (carbon tetrachloride). The normal boiling point of the solution is 61.51°C , the normal boiling point of CCl_4 is 61.2°C . The boiling point constant for CCl_4 is $4.95 \text{ K} \cdot \text{kg}/\text{mol}$. What is the molar mass of the compound? Answer in units of g/mol.