

Balance the following equation for an oxidation-reduction reaction occurring in an acidic solution:



The sum of the coefficients is:

- A) 24 B) 20 C) 29 D) 18 E) 22**

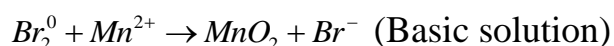
Balance the following equation for an oxidation-reduction reaction occurring in an acidic solution:



The sum of the coefficients is:

- A) 6 B) 8 C) 12 D) 4 E) 10**

Balance the following equation for an oxidation-reduction reaction occurring in a basic solution:



The sum of the coefficients is:

- A) 15 B) 11 C) 12 D) 8 E) 17**

1. Sort the elements according to their increasing ionization energy: $_{11}\text{Na}$, $_{19}\text{K}$, $_{9}\text{F}$, $_{12}\text{Mg}$, $_{10}\text{Ne}$

- A) $\text{F} < \text{Mg} < \text{Ne} < \text{K} < \text{Na}$ B) $\text{Na} < \text{K} < \text{F} < \text{Mg} < \text{Ne}$ C) $\text{Ne} < \text{Na} < \text{Mg} < \text{F} < \text{K}$
D) $\text{K} < \text{Na} < \text{Mg} < \text{F} < \text{Ne}$ E) $\text{Na} < \text{Mg} < \text{F} < \text{K} < \text{Ne}$

2. Arrange the following in order of increasing ionization energy: $_{3}\text{Li}$, $_{55}\text{Cs}$, $_{19}\text{K}$, $_{10}\text{Ne}$

- A) $\text{K} < \text{Li} < \text{Cs} < \text{Ne}$ B) $\text{Cs} < \text{K} < \text{Li} < \text{Ne}$ C) $\text{Ne} < \text{K} < \text{Cs} < \text{Li}$
D) $\text{Li} < \text{Cs} < \text{K} < \text{Ne}$ E) $\text{Cs} < \text{Ne} < \text{Li} < \text{K}$

3. List in order of increasing size of following atom and ions: $_{17}\text{Cl}^-$, $_{18}\text{Ar}$, $_{19}\text{K}^+$, $_{16}\text{S}^{2-}$, $_{20}\text{Ca}^{2+}$

- A) $\text{Cl}^- < \text{Ar} < \text{K}^+ < \text{S}^{2-} < \text{Ca}^{2+}$ B) $\text{K}^+ < \text{S}^{2-} < \text{Ar} < \text{Cl}^- < \text{Ca}^{2+}$
C) $\text{Ca}^{2+} < \text{K}^+ < \text{Ar} < \text{Cl}^- < \text{S}^{2-}$ D) $\text{S}^{2-} < \text{Cl}^- < \text{Ar} < \text{K}^+ < \text{Ca}^{2+}$
E) $\text{Ca}^{2+} < \text{S}^{2-} < \text{K}^+ < \text{Ar} < \text{Cl}^-$

4. List in order of decreasing size of following atom and ions: $_{17}\text{Cl}^-$, $_{18}\text{Ar}$, $_{19}\text{K}^+$, $_{16}\text{S}^{2-}$, $_{20}\text{Ca}^{2+}$

- A) $\text{Cl}^- > \text{K}^+ > \text{Ar} > \text{S}^{2-} > \text{Ca}^{2+}$ B) $\text{Ca}^{2+} > \text{Ar} > \text{S}^{2-} > \text{K}^+ > \text{Cl}^-$
C) $\text{Ca}^{2+} > \text{K}^+ > \text{Ar} > \text{Cl}^- > \text{S}^{2-}$ D) $\text{S}^{2-} > \text{Cl}^- > \text{Ar} > \text{K}^+ > \text{Ca}^{2+}$
E) $\text{Ar} > \text{K}^+ > \text{S}^{2-} > \text{Cl}^- > \text{Ca}^{2+}$

1. Which of the following is true in a periodic table?

- I) Ionization energy increases from right to left.
- II) Atomic radius increases from bottom to top.
- III) Metallic character decreases from left to right.
- IV) Atomic radius decreases from left to right.
- V) Anion radii are larger than neutral.

A) I and II B) Only III C) III and IV D) IV and V E) III, IV and V

2. Which of the following is not true in a periodic table?

- I) Ionization energy increases from right to left.
- II) Atomic radius increases from top to bottom.
- III) Metallic character increases from left to right.
- IV) Atomic radius decreases from left to right.
- V) Cation radii are larger than neutral.

A) I and III B) I, III and V C) III and IV D) I and II E) I, II and III

3. On the periodic table; which of the following specialties will decrease as you move left to right in a period?

- I) Atomic radius
- II) Electron Affinity
- III) Electronegativity
- IV) Atomic Number

A) Only I B) I and II C) I and III D) II and III E) II and IV

4. Which of the following is true in a periodic table?

- I) Atomic size increases from left to right.
- II) Electronegativity increases from bottom to top.
- III) Ionization energy increases from left to right.

IV) Atomic radius decreases from left to right.

V) Cation radii are larger than neutral.

- A) I, II and III B) I, III and V C) II,III and IV D) IV and V E) III, IV and V

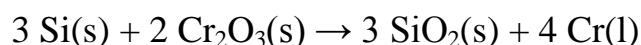
1- In the reaction $2 \text{Na} + 2 \text{H}_2\text{O} \rightarrow 2 \text{NaOH} + \text{H}_2$, how many liters of hydrogen at STP are produced from 50.0 grams of sodium? (Na = 23.0 g/mole, O = 16.0 g/mole, H = 1.0 g/mole)

- A) $(50.0/23.0) \cdot (22.4/2)$
B) $(50.0/23.0) \cdot (2) \cdot (22.4)$
C) $(50.0/23.0) \cdot (22.4)$
D) $(55.0/18.0) \cdot (22.4)$
E) None of these

2- In the reaction $\text{Fe}_2\text{O}_3 + 3 \text{H}_2 \rightarrow 2 \text{Fe} + 3 \text{H}_2\text{O}$, how many moles of iron can be produced using 17.4 liters of hydrogen at STP?

- A) $(17.4/22.4)(3/2)$
B) $(17.4/22.4)(2/3)$
C) $(17.4/22.4)$
D) $(17.4)(2/3)$
E) none of these

1- What is the percent yield if 185 grams of SiO_2 are made from 328 g of Cr_2O_3 by the following equation? (SiO_2 : 60 g/mol, Cr_2O_3 :152 g/mol)

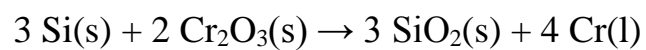


- A)95%
B)105%
C)56%

D)142%

E)70%

2- What is the percent yield if 122 grams of SiO_2 are made from 246 g of Cr_2O_3 by the following equation? (SiO_2 : 60 g/mol, Cr_2O_3 :152 g/mol)



A) 59.3%

B)125%

C) 83.6%

D)49.6%

E)33.1%