Unit 4 Chemical Reactions MCQ set 1
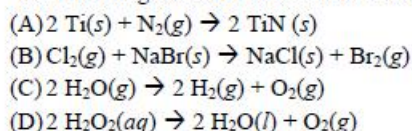
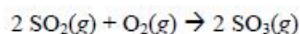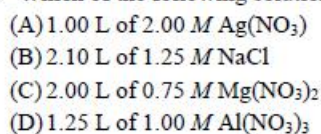**Unit 4 - Chemical Reactions**   Name:_____

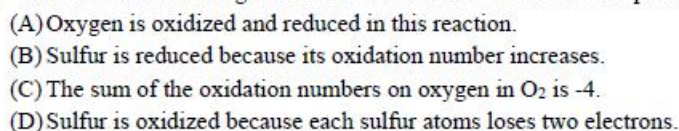**Multiple Choice I**
CALCULATORS CANNOT BE USED IN THIS SECTION

1. The largest number of electrons are transferred from one element to another in which of the following balanced chemical reactions equations?
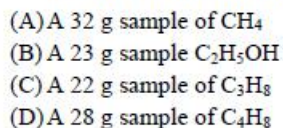   (A) $2\ Ti(s) + N_2(g) \rightarrow 2\ TiN\ (s)$
   (B) $Cl_2(g) + NaBr(s) \rightarrow NaCl(s) + Br_2(g)$
   (C) $2\ H_2O(g) \rightarrow 2\ H_2(g) + O_2(g)$
   (D) $2\ H_2O_2(aq) \rightarrow 2\ H_2O(l) + O_2(g)$

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2. Which of the following solutions contains the least number of moles of aqueous ions?
   (A) 1.00 L of 2.00 M Ag(NO$_3$)
   (B) 2.10 L of 1.25 M NaCl
   (C) 2.00 L of 0.75 M Mg(NO$_3$)$_2$
   (D) 1.25 L of 1.00 M Al(NO$_3$)$_3$

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$$2\ SO_2(g) + O_2(g) \rightarrow 2\ SO_3(g)$$

3. Which of the following statements about the above chemical equation is true?
   (A) Oxygen is oxidized and reduced in this reaction.
   (B) Sulfur is reduced because its oxidation number increases.
   (C) The sum of the oxidation numbers on oxygen in O_2 is -4.
   (D) Sulfur is oxidized because each sulfur atoms loses two electrons.

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4. Complete combustion of which of the following hydrocarbon samples would produce the least number of moles of CO_2?
   (A) A 32 g sample of CH_4
   (B) A 23 g sample C_2H_5OH
   (C) A 22 g sample of C_3H_8
   (D) A 28 g sample of C_4H_8

$$5\ SO_3{}^{2-} + 6\ H^+ + 2\ MnO_4{}^- \rightarrow 5\ SO_4{}^{2-} + 2\ Mn^{2+} + 3\ H_2O$$
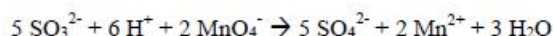
5. Which statement identifies the number of moles of electrons that are transferred between elements in the above balanced chemical equation with a correct justification?
    (A) 2 moles of electrons are transferred because the oxidation number on sulfur increases by two.
    (B) 2 mole of electrons is transferred because the oxidation number on manganese decreases by one.
    (C) 10 moles of electrons are transferred because each manganese gains five electrons.
    (D) 10 moles of electrons are transferred because each sulfur gains two electrons.

A	B	C	D
1.0 mol F(g)	1.0 mol F(g)	1.0 mol F(g)	1.0 mol F(g)
			1.0M NaCl
3.0M NaCl	3.0M NaBr	3.0M NaI	1.0M NaI
			1.0M NaBr

6. Each of the four sealed cylinders above contains 1.0 L of an aqueous halide solution. Exactly 1.0 mole of fluorine gas is drawn into the volume above each solution and the cylinders are shaken until all of the fluorine gas has reacted. Identify the cylinder that will produce the greatest mass of diatomic halogen molecules.
    (A) A
    (B) B
    (C) C
    (D) D

7. Which of the following correctly identifies the oxidation numbers on each element in KCN?
    (A) $ON_K = +2$, $ON_C = +4$, $ON_N = -6$
    (B) $ON_K = +1$, $ON_C = +2$, $ON_N = -3$
    (C) $ON_K = -1$, $ON_C = -2$, $ON_N = +3$
    (D) $ON_K = +1$, $ON_C = +4$, $ON_N = -5$