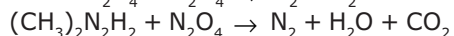
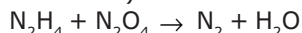


An Apollo spacecraft was launched on a Saturn V rocket using "Aerozine 50" as fuel. Aerozine 50 is a blend of hydrazine (N_2H_4) and dimethylhydrazine [$(CH_3)_2N_2H_2$], 50.0% by mass in each component. Nitrogen tetroxide (N_2O_4) was used as the oxidizer. Assume that the two components of Aerozine 50 underwent complete combustion according to the following (unbalanced) reactions :



If 1420 kg of Aerozine 50 was consumed in the ascent. Calculate following

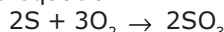
[Note : Equations are not balanced]

- Q.1** The mass of nitrogen tetroxide consumed in the ascent-
 (A) 3197 kg (B) 4217.2 kg
 (C) 2110.02 kg (D) None of these
- Q.2** The mass of CO_2 formed as result of ascent is-
 (A) 1041 kg (B) 2082 kg
 (C) 520 kg (D) None of these
- Q.3** The equivalent volume of water in lit. at $4^\circ C$ 1 atm generated in the ascent-
 (A) 851.76 L (B) 1059 L
 (C) 47.32 L (D) None of these

FOLLOWING QUESTIONS ARE NOT BASED ON ANY PARAGRAPH :

- Q.4** Silver has two naturally occurring isotopes with the following isotopic masses :
 ^{107}Ag ^{109}Ag
 106.90509 amu 108.9047 amu
 The average atomic mass of silver is 107.8682 amu. The fractional abundance of the lighter of the two isotopes is :
 (A) 0.2422 (B) 0.4816
 (C) 0.5184 (D) 0.7578 (E) 0.9047
- Q.5** Use the law of multiple proportions to consider possible formulas for compounds made from two elements, X and Y, in the proportions listed below.
 Compound A : 1.0 g of X reacted with 2.1 of Y
 Compound B : 1.0 g of X reacted with 6.3 g of Y
 Which of the following sets of formulas is not possible ?
 (A) A : X_2Y_3 ; B : X_2Y_9 (B) A : XY; B : XY_3
 (C) A : X_6Y_2 ; B : XY (D) A : X_2Y_2 ; B : X_3Y_6
 (E) A : X_2Y_3 ; B : X_4Y_{18}

- Q.6** Sulphur reacts with oxygen gas to form sulphur trioxide as indicated in the following balanced equation :



Given the reactants in the box on the left, which of the boxes on the right (if any) accurately portrays the expected theoretical yield and any excess

a.

b.

c.

d.

e. none of the above

- Q.7** Consider the following two solutions :
Solution A Solute is Gold (I) Nitrate
 Volume = 100 mL Concentration = 1.00 M
Solution B Solute is Sodium Carbonate
 Volume = 60.0 mL Concentration = 2.00 M
 If solutions A and B are mixed together, what is the identity of the precipitate that forms and how many moles of the precipitate will be formed ?
 (A) $AuCO_3$, 0.100 mol (B) $AuCO_3$, 0.120 mol
 (C) Au_2CO_3 , 0.0500 mol (D) Au_2CO_3 , 0.100 mol
 (E) Au_2CO_3 , 0.120 mol
- Q.8** The element magnesium has three naturally occurring isotopes, ^{24}Mg , ^{25}Mg , ^{26}Mg . Given the information in the table below, calculate the average atomic weight for a magnesium atom.
- | Isotope | Mass | % Abundance |
|-----------|-----------|-------------|
| ^{24}Mg | 23.985042 | 78.99 |
| ^{25}Mg | 24.985837 | 10.00 |
| ^{26}Mg | 25.982593 | 11.01 |
- What is the average atomic mass of magnesium
 (A) 24 (B) 24.6
 (C) 24.3 (D) 24.56
- Q.9** Chlorine has two naturally occurring isotopes, ^{35}Cl and ^{37}Cl . How many different ways can the isotopes of Mg and Cl combine to form $MgCl_2$? Write chemical formulas for four different combinations-
 (A) 3 (B) 6
 (C) 9 (D) 4

CHEMISTRY IIT JEE (CLASS TEST - 6) (PHYSICAL) ANSWER KEY

Name : Roll No. :

	A	B	C	D	E		A	B	C	D	E		A	B	C	D	E
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>