

Thermal Decomposition Questions

Question 1: X, Y, and Z are three crystalline solids. When all three are heated with conc. Sulphuric acid and copper turning produces a reddish brown gas W. When X is heated it produces a gas M that relights glowing splint. When Y is heated in a test tube, it produces a reddish brown gas and the yellow residue sticks (fuses) to the test tube. When Z is heated no residue is left and the gas produced turn moist red litmus paper blue.

1. Identify M, W, X, Y and Z
2. Give an equation for the reaction between conc. H_2SO_4 and X.
3. Give an equation for the reaction when Y is strongly heated.

Question 2: A, B, C and D are solid crystalline substances. A when heated gives off only one gas, E that relights glowing splint. B decomposes into two gases, F and water vapour completely leaving no residue. Solid C gives a brown gas G and E. solid D also produces same gases as C but its residue, which is yellow, sticks or fuses with the test tube. Identify A, B, C, D, E, F and G and write balance chemical equation for the above reactions.

Question 3: A, B, C and D are solid crystalline substances. A when strongly heated decomposes into two gases, X and Y completely leaving no residue. Gas X is a compound of nitrogen, and Gas Y turns anhydrous copper sulphate blue. Gas B when strongly heated also produces two gases, M and N. Gas M, which comes out first, turns red litmus blue but gas N, which comes out later, turns the blue litmus red again. Both solid C and D on strongly heating produces again two gases, one of them, S, is coloured and another, T, which is colourless, relights glowing splint and a residue. Residue in the C is a liquid, where as D is a solid. Identify A, B, C, D, M, N, S, T, X and Y. Write balance chemical equation for all the above reactions also.

Question 4: A very inert gas X when reacted with another gas Y in presence of iron catalyst, Z is formed. Neither X or Y is acidic or basic but Z turns moist red litmus blue. Y when burnt in air forms W that turns blue cobalt chloride paper pink. If Z is burnt in air, in presence of platinum/Rhodium catalyst S is formed which when further reacts with excess air and W forms T. Z when reacts with T, forms M. When M is strongly heated N and W is formed. Identify compounds X, Y, Z, W, S, T, M and N and write balanced chemical equation for each of these reactions stated above.

Question 5: Answer the following:

1. Give a reaction between concentrated HNO_3 and copper turning
2. Write a balanced equation between sulphur and hot conc. Nitric acid.
3. Name a solution which gives nitrogen dioxide with copper
4. Write balanced equation for action of heat on sodium, potassium and copper nitrate.
5. Write balanced equation for action of heating nitrogen monoxide and oxygen
6. Write balanced equations for nitric acid formation during thunderstorm. (3 steps)
7. Write a balanced equation for action of heat on ammonium nitrate.
8. Write balanced equations for preparation of nitric acid from potassium nitrate. (2 steps)
9. Give name of a substance which produced a gas which turns limewater milky from HNO_3
10. Why HNO_3 leaves a yellow colour when left standing in an ordinary glass bottle?
11. Give name of a substance that converts Sulphur into sulphuric acid directly.
12. Give name of a substance, which produces a brown gas in presence of copper turnings.
13. Name two metal nitrates which produces only one gas on heating
14. Name three nitrates that produces coloured residue, on heating. Also state the colour of the residue with the balanced chemical equation for the above three reactions.
15. Name two nitrates which leaves no residue, and a liquid residue on heating.