4. Would hydrogen make a good substitute for coal-gas (*a*) in an ordinary lighting burner, (*b*) in a burner fitted with an Auer-light mantle, (*c*) in a gas stove? Why?

5. Sometimes fearful explosions occur in flour mills; what do you think is the cause? Might some of the explosions in coal mines be due to a similar cause?

6. If your stock of metallic sodium took fire, would you use water or sand to extinguish it? Why?

7. When hydrogen is prepared by the action of zinc on sulphuric acid, what else is formed? What becomes of it?

8. Potassium (K) reacts with water in the same way that sodium does; write the equation representing the reaction.

9. Compare oxygen and hydrogen as to (*a*) occurrence, (*b*) properties.

10. In the apparatus pictured in Fig. 7 why should the thistle-tube extend almost to the bottom of the flask?

11. How could you distinguish a bottle of oxygen from one of hydrogen?

12. Compare oxidation and reduction. Is the one just the opposite of the other?

13. Why is hydrogen called a reducing agent? Iron? Examples.

(*The following calculations should be left till Chapter VIII has been studied.*)

14. How much zinc and sulphuric acid must be used to produce 100 grs. of hydrogen? (Note: the two chemicals must be reported separately.)

15. What volume of hydrogen could be produced by acting on 23 grs. of sodium with water?

16. How much water could 92 grs. of sodium decompose?

17. A balloon has a capacity of 1,000 litres. How much zinc and sulphuric acid will be required to produce sufficient hydrogen to fill it at 750 mm. and 18°? With zinc at 15c. per pound and iron at 4c., what would be the cost of each metal for the above filling?