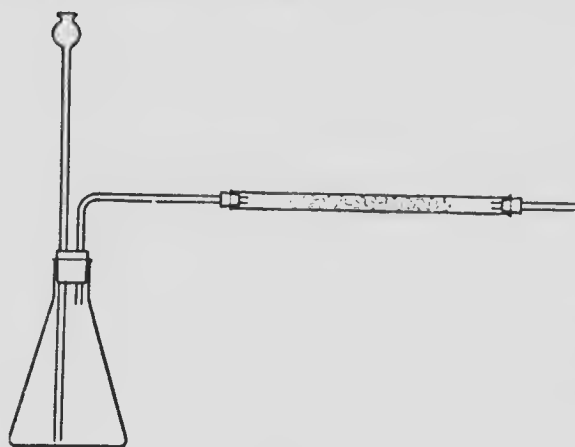
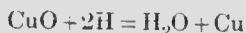


EXPERIMENT.—Place some copper oxide in a hard-glass tube and support it above a burner. Connect this tube with a hydrogen generator, as in the figure, and heat the tube while the hydrogen is passing. (The usual precautions against explosion must be taken.) The copper oxide



is reduced to metal, as can be seen by the change in color, and water is produced at the same time.



We have already noticed two classes of chemical action, *i.e.*, analysis and synthesis—this chapter furnishes us

FIG. 9.

with several examples of a third class, *i.e.*, replacement. In the action of sodium on water, of zinc on sulphuric acid, of hydrogen on copper oxide, this sort of reaction takes place and it may be defined as follows:

Replacement, or *substitution*, is the action that takes place between a chemical compound and another substance, generally an element, whereby this other substance combines with a part of the compound, liberating the rest—the other substance takes the place of a portion of the compound.

QUESTIONS

1. What did the old chemists mean by "inflammable air?" Why did they call it so?
2. How would you explain the presence of some hydrogen in the "air" obtained from the coils of a hot-water furnace?
3. Why must all the air be driven out of the hydrogen generator before the issuing hydrogen is ignited? Why do we wrap a towel round the flask? Is hydrogen itself explosive?