CHAPTER VII.

SOLUTIONS.

Classification of Solutions. Having dealt with the properties of pure substances in the gaseous, liquid and solid states we now proceed to the consideration of the properties of mixtures of two or more pure substances. When such a mixture is chemically and physically homogeneous, and no abrupt change in its properties results from an alteration of the proportions of the components of the mixture, it is termed a *solution.* When one substance is dissolved in another, it is customary to designate as the *solvent* that component which is present in the larger proportion, the other component being termed the *solute.* When not more than one-tenth mol of solute is present in one liter of solution, the solution is said to be *dilute.* The detailed study of dilute solutions will be deferred until the next chapter.

There are nine possible classes of solutions, as follows: —

(1) Solution of gas in gas;
(2) Solution of liquid in gas;
(3) Solution of solid in gas;
(4) Solution of gas in liquid;
(5) Solution of liquid in liquid;
(6) Solution of solid in liquid;
(7) Solution of gas in solid;
(8) Solution of liquid in solid;
(9) Solution of solid in solid.

While examples of all of these different types of solutions are known, only the more important classes will be considered here.

Solutions of Gases in Gases. In solutions of this class the components may be present in any proportions, since gases are completely miscible. In a mixture of gases where no chemical action occurs, each gas behaves independently, the properties of