and hydrogen is set free. But, if an oxide of iron is heated in an atmosphere of hydrogen, iron is reduced and water is formed. This goes on until the atmosphere contains certain proportions of hydrogen and water, and then no further reduction takes place. The same limit is reached when iron is heated in an atmosphere of water vapour. It is therefore possible to make a mixture of hydrogen and water vapour which will neither oxidise iron nor reduce oxides of iron. If in such a mixture the proportion of water vapour is increased, the mixture becomes capable of oxidising iron at a red heat; but if the proportion of hydrogen is increased, the reverse action, viz., the reduction of iron oxides, is brought about.

The influence of mass on chemical change is much more extensive than was at one time thought. Chemical changes can be brought about which were formerly thought to be impossible. Chlorine easily displaces bromine from its compounds with metals, and at first sight it would seem impossible to reverse this substitution; but if sodium chloride be heated in a closed tube with bromine, a certain proportion of the chlorine is displaced by the bromine, and *this proportion is increased by increasing the quantity of bromine in the tube.* Here the action of mass is very plain.

8. **Raoult's Law.**—It is a well-known fact that salt water requires a lower temperature to freeze it than pure water does. The freezing point of solvents is in general lowered by the presence in them of dissolved substances; and the amount by which the freezing point is lowered is, for the same substance, approximately proportional to the percentage of the dissolved substance*. Thus the freez-

* This applies only to dilute solutions.