

well as by other causes. He compares the action of oil of turpentine in these cases to that of the blood in respiration.

*Hydrated Silica.*—Liebig has found that the solubility of silica depends essentially upon the circumstance whether or not a sufficient quantity of water for its solution is present at the moment of its separation. If a solution of a soluble silicate, the strength of which per cubic centimetre is known, be gradually diluted with measured quantities of water, a point may be arrived at when, on the addition of acid, the fluid remains perfectly clear, and no silica is separated. In this way water can dissolve as much as one five-hundredth of silica.

Ammonia and its salts materially diminish the solubility of silica.

*Action of Carbonates.*—Rose has carefully examined the circumstances under which insoluble or nearly insoluble salts, such as the sulphates of baryta, strontia, and lime, &c., are decomposed by alkaline carbonates. When the soluble salt formed is capable of decomposing the insoluble salt produced, the decomposition is hindered, and can only be effected by constant removal of the soluble salt, or employment of an excess of the decomposing salt.

When no such decomposing action of the resulting soluble salt upon the insoluble one takes place, the decomposition goes on in accordance with the ordinary laws of affinity. An alkalic carbonate decomposes sulphate of baryta, and an alkalic sulphate decomposes carbonate of baryta, hence very imperfect decomposition can be produced from equivalent weights of these salts. An alkalic carbonate can decompose sulphate of strontia, but an alkalic sulphate has no effect upon carbonate of strontia, hence in this case a nearly complete decomposition is effected. The same is the case with the sulphates of lime and lead, and is doubtless connected with the partial solubility of these sulphates, for if the smallest quantity were to be formed and dissolved in the fluid, it would be immediately decomposed by the action of the alkalic carbonate.

*Cement.*—M. Sorel announces the formation of a very hard and durable cement by the action of chloride on oxide of zinc. The analogous chlorides may be substituted for that of zinc. The cement may be poured into moulds like plaster, becomes as hard as marble, is not affected by cold, moisture, or even by boiling water, and is but slowly acted on by strong acids. It has been long used as a cement for stopping teeth. It can also be employed as a very hard and durable paint.

*Strength of Bases.*—Rose has found that there is no more certain means of ascertaining the strength or weakness of the basic properties of the different metallic oxides than treating them with solutions of inodorous ammoniacal salts, especially of chloride of ammonium. All metallic bases of the composition  $2R + O$  and  $R + O$  decompose the ammonia salt, while those of the formula  $2R + 3O$ , and others containing still more oxygen are unable to effect the decomposition even after long boiling. The only exception is in the case of glucina, but many chemists have been inclined to rank this among the oxides of the formula  $R + O$ , and very recently Debray has concluded that glucina must be regarded as an earth which has no analogue, standing midway between the bases  $R + O$  and  $2R + 3O$ .

In a later paper Rose inclines to the formula  $2G + 3O$  for glucina. He finds that glucina exposed to the heat of a porcelain furnace forms a dense caked mass, of specific gravity 3.021 and exhibiting under the microscope regular prismatic crystals like the native alumina or corundum. Alumina, when heated in the same manner, acquires a density of 3.99 or 4.0, and if from these numbers the atomic volumes be