## Behavior of Colloidal Suspensions, Etc. 713

homogeneous solution, and then adding more alcohol drop by drop, shaking, and letting stand until the two layers separated. As each drop of alcohol was added and the two layers approached one another in composition, the amount of arsenious sulphide in the upper layer increased until the colors of the two layers were almost equal. More of the sulphide went into the upper layers, other things being equal, when excess of hydrogen sulphide was used; but even with a considerable excess of arsenie (recognized by coagulating the sulphide with a drop of hydrochlorie acid, filtering, and treating separate portions of the filtrate with arsenions acid and with hydrogen sulphide respectively) the distribution was casily observable.

Left to themselves, such two layered systems with distributed sulphide may remain for days apparently mehanged; but it was generally observed that sooner or later the upper layer lost its yellow color.

The upper layer is a very clear yellow with a touch of orange, and none of that milkiness usually observed with colloidal solutions; in this respect it resembles Linder and Picton's Arsenious sulphide  $\delta$  which gave no Tyndall effect; the lower layer was almost equally clear. It is, in fact, only with such clear solutions that distribution was observed; if ether and alcohol were added to the ordinary boiled arsenious sulphide hydrosol, which relatively speaking is quite turbid, the sulphide remained in the lower layer until the last drop of alcohol made the whole homogeneous. By adding ether to a two-layered system, the volume of the lower layer may be diminished and the arsenious sulphide in it concentrated. When the concentration reaches a certain point, depending on the composition of the system, a trace of cloudiness may be detected, which increases with further addition of ether; the color at the same time changes from orange-yellow to a more lemon-yellow tint. It is thus possible to pass gradually, or 'continuously' so to speak, from perfectly clear to almost opaque colloidal solutions. Any one of these may be brought to the plait-point by adding alcohol and water in suitable