33. "Prescription Incompat.," Robinson, p. 133 (1919).
34. *Pac. Drug. Rev.*, v. 31, p. 31, Dec. (1919).
35. JOUR. A. PH. A., v. 11, pp. 796–8 (1923).
36. *Pharm. Weekbl.*, v. 54, p. 155 (1919); through Y. B., v. 8, p. 136 (1919).
37. *Bull. of Pharm.*, v. 28, p. 527 (1914); *Ibid*, v. 29, p. 174 (1915).
38. "Incompat. in Prescriptions," Ruddiman, Ed. 4, p. 163 (1917); "U. S. Dispensatory," Ed. 20, p. 19 (1918).
39. "Even when death is not caused by this mixture, rash or other distressing symptoms have frequently followed the using of the two common drugs at the same time," *Drug. Circ.*, v. 68, p. 152 (1924); "In quinine aspirin powders that have been kept some time dangerous quantities of quinotoxin may have been formed," *Pharm. Jour.*, v. 97, p. 27 (1916); through "Digest of Comments," (1916).
40. "Prescription Incompatibilities," Robinson, p. 196 (1919).
41. *Jour. A. M. A.*, v. 76, p. 999 (1921).
42. *Giorn. Chim. Ind. applicata*, v. 4, p. 265 (1922); through *Chem. Abstr.*, v. 16, p. 3170.
43. JOUR. A. PH. A., v. 13, p. 1009 (1924).
44. *Ber. der Deutsche Chem. Ges.*, v. 28, p. 1058 (1895).
45. *Merck's Report*, v. 32, p. 148 (1923); see also "British Y. B.," p. 630 (1923).
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47. *Pharm. Jour.*, v. 107, p. 232 (1921); through YEAR BOOK, v. 10, p. 515 (1921).
48. *Pac. Drug. Rev.*, Apr. (1916).
49. *Am. Drug.*, v. 62, p. 93 (1914); through "Digest of Comments" (1914).
50. JOUR. A. PH. A., v. 11, p. 796 (1922); see also *Merck's Rep.*, Jan. (1923); *The Spatula*, (1924); *Nat. Drug.* (1924).
51. "Incompat. in Prescriptions," Ruddiman, Ed. 4, p. 255 (1917).
52. *Pharm. Ztg.*, v. 45, p. 816 (1900); through PROC. A. PH. A., v. 49, p. 627 (1901).
53. *Pharm. Jour.*, v. 22, p. 346 (1906); through "British Y. B." (1906).
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A NEW EMULSIFYING AGENT FOR VOLATILE OILS.*

BY CHARLES H. LAWALL.

Several years ago while working with a commercial volatile oil emulsion, the ingredients of which were identified as having been used for producing a permanent degree of emulsification were so unusual in their character, that after the particular piece of research was completed, some experiments were performed with the substances in question. These experiments led to a recognition of the fact that a mixture of 20% of powdered egg albumin and 80% of powdered cream of tartar is an emulsifying agent with a selective power of sub-dividing or emulsifying volatile oils rather than fixed oils.

One of the particular points of interest in connection with this rather empiric combination is the fact that it can be used in very much smaller quantities than emulsifying agents usually are capable of serving. This can be best illustrated by giving a typical formula for such an emulsion with working directions.

To emulsify volatile oils heavier than water, such as oil of sassafras, wintergreen or clove, place 100 cubic centimeters of the oil in a bottle of a capacity of 200 cubic centimeters. Add one gram of the emulsifying mixture, consisting, as stated, of 20% egg albumin and 80% cream of tartar and agitate well. Then add

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100 cubic centimeters of water and agitate violently for about one minute. The oil immediately becomes sub-divided without, however, increasing the mixture greatly in viscosity. Standing for any length of time does not appear to influence the oil in the matter of coalescing into globules or drops. The mixture has a tendency to separate into a lighter aqueous layer and a heavier layer of microscopic globules of oil, but even after more than a year's standing in a number of specimens which I have made, there has been no tendency in the oil to run together into larger globules.

For volatile oils that are lighter than water, the amount of emulsifying powder that is to be taken is about two and a half times that required for the heavy oils. In these cases the emulsification is equally permanent, and very satisfactory for purposes of making the so-called concentrates which are employed for adding to syrups in the preparing of flavors for the carbonated beverage industry. Experiments with the emulsifying powder with immiscible liquids like chloroform, ether, benzene, kerosene gave rather unsatisfactory results. With fixed oils the results are not as good as ordinary emulsification materials.

The facts are simply published for the benefit they may have for those who are studying the subject of emulsification and a practical aid in making volatile oil concentrates, miscible with syrup to be used for flavoring purposes.

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NOTES ON SILICA GEL AS A FILTERING AGENT.*

BY E. V. HOWELL.

Silica gel is chemically a hydrated form of pure silica and is accordingly extremely resistant to most reagents.

Physically it is a hard, semi-transparent, glassy substance. Its hardness, according to the mineral scale, is about 5 and it undergoes but little abrasion with ordinary handling.

The word "Gel" does not, however, accurately suggest the physical nature of the material as used, but rather refers to its condition at one stage of manufacture. It is a hard, glassy material, with the appearance of a clear quartz sand and having the chemical formula of SiO_2. The thing that differentiates this unique material, silica gel, from ordinary sand is its highly porous structure, and especially the size and uniform arrangement of the pores.

Silica gel is made by mixing, in proper proportions and in a pre-determined manner, solutions of sodium silicate and sulphuric acid. After several hours this mixture sets to a homogeneous, jelly-like mass, which is called hydrogel. This hydrogel is then broken into pieces about one inch in size and thoroughly washed to free it of sodium sulphate and excess acid. It is subsequently dried in a carefully regulated manner until it has shrunk to a constant volume (about 10% of its original volume). It is then known as "Silica Gel" and is ready for the final activation necessary before it can be used in any of its many applications. This activation is

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