

1

2

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METHOD OF IMPARTING COLOR TO PHARMACEUTICAL SOLUTIONS

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This invention relates to new coloring compositions and to novel processes for imparting a color to a pharmaceutical solution. More particularly, this invention relates to methods for applying water insoluble colors to aqueous pharmaceutical preparations and the new coloring compositions employed therefor.

Heretofore, it has been possible to color an aqueous pharmaceutical solution only by employing exceedingly large quantities of the water insoluble coloring material and the results obtained have not been uniformly satisfactory. It was found that a water insoluble coloring material, when applied to an aqueous pharmaceutical solution, behaves like a pigment, and exceedingly large quantities must be used to impart a color thereto. After these large quantities of coloring material are employed, the color of the resultant pharmaceutical composition was unsatisfactory, as the insoluble coloring material settled out in substantial amounts, even after only short periods of storage.

A great number of coloring materials which may otherwise be satisfactorily employed for the purposes here desired may not be used in pharmaceutical compositions as their use is forbidden or limited by the Food and Drug Administration.

This invention has as one of its objects the preparation of aqueous pharmaceutical solutions possessing uniform color characteristics, which color characteristics are not lost after storage for extended periods of time.

Another object of this invention is the application of a water insoluble coloring material to an aqueous pharmaceutical solution.

Still another object of this invention is the imparting of a color to a pharmaceutical solution by the employment of Food and Drug Administration approved coloring materials.

Yet another object of this invention is the imparting of a color to a pharmaceutical solution by the employment of an economical and efficient method not heretofore known.

Still other objects of this invention will become apparent from a further reading of this specification.

The coloring materials, which may be employed in the practice of this invention are those which are substantially water insoluble and are certified for use in pharmaceutical compositions. More specifically, they include such dyes designated by their Food and Drug Administration designations as D & C Blue No. 6, D & C Blue No. 9, D & C Green No. 6, D & C Violet No. 2, D & C Red No. 17, D & C Red No. 19, D & C Red No. 21, D & C Orange No. 5, D & C Yellow No. 7, D & C Yellow No. 11, D & C Red No. 6, D & C Red No. 7, D & C Red No. 35, D & C Orange No. 15, D & C Yellow No. 6, D & C Green No. 1, D & C Blue No. 1, D & C Violet No. 7, and other like coloring materials. Further exemplary are the substantially water insoluble FD & C and D & C colors listed in the Merck Index, Sixth Edition.

It has now been found that a uniform color, which is retained by the aqueous pharmaceutical solution, even after extended periods, may be produced by the employment of a water insoluble coloring material. According to the novel process of this invention, the coloring material is first dissolved in an organic solvent and the result-

ing solution is deposited on the surface of a free-flowing particulate, water soluble material.

The organic solvents which may be employed in the practice of this invention are those volatile solvents in which the respective coloring material may be completely dissolved. They include such organic solvents as acetone, methanol, benzene, ethanol and other like volatile solvents. In the most preferable embodiment of this invention, acetone is employed, although the other solvents yield the same results. The particulate water soluble material which may be employed in the practice of this invention, is one which is non-toxic, pharmaceutically acceptable and is free-flowing and will absorb the water insoluble coloring material on the surface thereof and includes such materials as sugars, such as lactose, sucrose or dextrose; salts, such as sodium chloride, or potassium chloride; and hydrocolloids, such as acacia, guar gum, tragacanth, sodium carboxy methyl cellulose, gelatin and mannitol.

In the most preferable embodiment of the invention, crystalline sucrose is employed. The coloring material in the solution is deposited on the surface of the water soluble particulate material, the solvent is driven off yielding a substantially dry, coloring composition comprising a freely dispersible particulate water soluble material, having the substantially water insoluble coloring material intimately and uniformly adherent to the surfaces thereof. This coloring composition may be employed directly and immediately in imparting a color to a pharmaceutical solution or it may be held in its substantially dry state for future use in the furtherance of the principles of this invention.

The coloring composition is employed to impart color to any aqueous pharmaceutical solution by its intimate dispersion into the pharmaceutical solution to be treated. This intimate dispersion may be accomplished in any manner known to the art to accomplish such an objective, for example, by introducing the desired amount of substantially dry coloring composition into the aqueous pharmaceutical solution by vigorous mixing, as by treatment on a rotary shaker until a substantially uniform color is obtained.

The amounts of the respective ingredients which may be employed in the practice of this invention are those which will impart a uniform color to an aqueous pharmaceutical solution. It has been found that the respective amount of the ingredients which may be used to produce the final products of this invention are from about 0.001% to about 1.0% by weight of the insoluble coloring material about 0.1% to about 20.0% of the water soluble particulate material and about 75.0% to about 99.9% of the aqueous pharmaceutical solution.

The aqueous pharmaceutical solutions which may be employed in the practice of this invention include those solutions which possess antibiotic, steroidal and diuretic activity. Included in such aqueous pharmaceutical solutions are tetracycline compositions, amphotericin compositions, progestogen compositions, benzothiadiazine compositions and other like pharmaceutical preparations. In the most preferable embodiment of this invention the aqueous pharmaceutical product is one of antibiotic activity, such as tetracycline, although others may be employed with like results.

The following example is illustrative of the invention:

Example 1

Into 6.0 cc. of acetone there is dissolved 0.12 g. of D & C dye Red No. 21 with stirring. The resultant solution is then sprayed evenly over the surface of 25 g. of crystalline sucrose in a revolving pan until the entire surface of the sucrose has been colored by the solution. The ace-

3

tone solvent is then driven off and the resultant dried colored sucrose is then dissolved in 1000 ml. of a 3% aqueous suspension of tetracycline with vigorous mixing to yield a substantially evenly colored aqueous suspension of tetracycline.

Similarly, if equivalent amounts of aqueous pharmaceutical solutions of such pharmaceuticals as tetracycline, dimethyltetracycline, amphotericin etc. are substituted for tetracycline, like results are obtained.

The invention may be variously otherwise embodied within the scope of the appended claims.

What is claimed is:

1. A process for imparting a uniform color to an aqueous pharmaceutical solution which comprises

(a) dissolving a water insoluble pharmaceutically acceptable non-toxic coloring material in an organic solvent;

(b) dispersing the said coloring material over the surface of a water soluble pharmaceutically acceptable free-flowing particulate material selected from the group consisting of sugars, salts and hydrocolloids by contacting said particulate material with the said colored organic solution;

(c) removing the said organic solvent to obtain a substantially dry coloring composition comprising particulate material having adherent to the surfaces thereof the said insoluble coloring material; and

(d) intimately introducing into an aqueous pharmaceutical product the said coloring composition to obtain a uniformly colored aqueous pharmaceutical solution.

2. A coloring composition for imparting a water insoluble color to an aqueous pharmaceutical solution which comprises a substantially free-flowing, non-toxic, pharmaceutically acceptable water soluble particulate material selected from the group consisting of sugars, salts and hydrocolloids having a water insoluble coloring material adherent to the surfaces thereof.

3. A process for imparting a uniform color to an aqueous pharmaceutical solution which comprises:

(a) dissolving a water-insoluble pharmaceutically acceptable non-toxic coloring material in an organic solvent;

(b) dispersing the coloring material over the surface of a water-soluble pharmaceutically acceptable free-

4

flowing crystalline sucrose material by contacting said material with the colored organic solution;

(c) removing the said organic solvent to obtain a substantially dried coloring composition comprising particulate sucrose having adherent to the surfaces thereof the said insoluble material;

(d) intermittently introducing into an aqueous pharmaceutical product the said coloring composition to obtain a uniformly colored aqueous pharmaceutical solution.

4. A process in accordance with the process of claim 1 wherein the organic solvent is selected from the group consisting of acetone, methanol, ethanol, and benzene.

5. A process in accordance with the process of claim 1 wherein the particulate material is selected from the group consisting of lactose, sucrose, dextrose, sodium chloride, potassium chloride, acacia, guar gum, tragacanth, sodium carboxymethylcellulose, gelatin and manitol.

6. A composition in accordance with claim 2 wherein the particulate material is sucrose.

7. A composition in accordance with claim 6 wherein the water-insoluble coloring material is D & C No. 21.

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