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VISUAL INDICATING SOLUTION

John J. Hayden, Hoosick Falls, N.Y., assignor to General Aniline & Film Corporation, New York, N.Y., a corporation of Delaware
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1 Claim. (Cl. 252-408)

The present invention is directed, in general, to infusion visual indicator solutions for producing a color upon contact with water and in particular, the present invention is directed to compositions which, upon contact with water will produce a desirable detectable color which is admirably adapted for use in charting of currents and direction of water in bodies of water.

Heretofore, according to customary practices, dye compositions, capable of producing a detectable color suitable for use in charting of current and direction of flow of water, have been known. In this respect, many dye compositions have been employed which, when cast upon the water, will reflect a fluorescent color such as yellow, orange, red or the like, to facilitate the identification or location of place or material which it is desired to identify. However, a significant number of problems and disadvantages have arisen with respect to the efficiency of these types of materials, as visual indicator devices, which are particularly designed to identify and locate particularly desirable areas of places or things as to prompt expenditure of time and effort to overcome these problems and disadvantages. Among the disadvantages presently possessed by commercially available visual indicator compositions include the fact that the indicating compositions are not sufficiently soluble in the bodies, such as water, into which they are placed. In addition, where certain compounds or compositions possess the desired solubility in water or sea water, they lack the sufficient density whereby they remain in the surface of the water for a sufficiently long period of time so that they can be detected. Furthermore, some of these compositions lack sufficient concentration of the dye component to enable detection over extended periods.

Yet another disadvantage of commercially available visual indicator compositions is their rather poor shelf life, i.e. the compositions are not stable on standing for any length of time and the dye component precipitates out of the solution.

Accordingly, it is an object of this invention to provide certain visual indicating compositions or solutions possessed of certain specific gravity characteristics which will enable them to be carried along in bodies of water so that they may be identified over long periods of time as a result of their color characteristics.

In addition, it is a further object of this invention to provide visual indicator compositions having a dye component present therein in a sufficient concentration whereby over extended periods of time the visual indicator compositions will remain present in certain bodies of water so that they may be observed and as a result thereof said compositions will be useful in the charting of the direction and speed of currents of bodies of water into which they are placed.

Still another object of this invention resides in the provision visual indicator compositions which are characterized by good shelf life on standing prior to use.

Other objects and advantages of the invention will become further apparent from the following detailed description thereof.

The realization and attainment of the above objects of the invention are based, in part, upon the discovery

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that organic solvent solutions having a specific gravity at 15° C. in the range of from 1.020-1.030 and containing from 40-50 parts of a fluorescent, relatively water and alcohol soluble basic dye per 100 parts of solution, are particularly adapted for use in the aforesaid manner.

In formulating the compositions of the invention a selected dye is dissolved in a solvent such as aliphatic monocarboxylic acids and/or aliphatic monohydric alcohols. In practice, the dye is dissolved in either the acid or alcohol and sufficient additional solvent is then added to provide the desired specific gravity. In general, it has been found that 100 parts of a selected dye dissolved in from 60-70 parts of an aliphatic monocarboxylic acid such as glacial acetic acid to which has been added sufficient aliphatic monohydric alcohol to provide the desired specific gravity range will function admirably well in achieving the objects of the invention.

In a further embodiment of the invention it has been found that the addition of a polyol to the compositions of the invention such as glycerine enhances the stability, and thus the shelf life, of the compositions of the invention. In this regard from 2-10 parts of a polyol, such as glycerine, have been found to enhance the stability of the compositions.

Yet another feature of the invention resides in the provision for use of higher aliphatic monocarboxylic acids in conjunction with the solvents for the dye. In particular, the higher aliphatic monocarboxylic acids, such as propionic acid have been found useful when the dye present in the compositions is more concentrated. In general, from 0-20 parts of a higher aliphatic monocarboxylic acid will provide acceptable results.

Representative solvents which can be employed to effect solution of the dye include acetic acid, methanol, ethanol, propanol, and the like.

The fluorescent, relatively water and alcohol soluble dyes which can be employed in the manufacture of the compositions of the invention preferably are the basic yellow, red and orange dyes. Representative fluorescent, relatively water and alcohol soluble basic dyes include the Rhodamine dyes such as Rhodamine 7B (C.I. 45170) and Rhodamine 6G (C.I. 45160). Numerous other dyes may be employed such as Brilliant Sulfoflavine FF (C.I. 56205) Genacryl Orange G (C.I. 48035), Genacryl Orange R (C.I. 48040), Genacryl Red 6B (C.I. 48020), Genacryl Yellow 3G (C.I. 48055), Genacryl Yellow 5G (C.I. 48065) and the like.

If desired, the compositions of the invention can be included in an infusion package or can be included in a dispersing unit for housing and controlling the discharge of the compositions of the invention into a body of water to be charted. When embodied as a component of an infusion package, the infusion package can be of the usual types known in the art wherein the infusing substance can be infused directly from and through the walls of the infusion package construction. This aspect is particularly desirable for the charting areas of water which are inaccessible by land and necessitate dropping the infusion package from an airplane into a body of water which is under study.

While the invention has been described with particularity with respect to certain specific embodiments thereof it is obvious that variations and modifications thereof will occur to those skilled in the art upon reading this specification and it is intended that all such modifications and embodiments thereof are included within the spirit and scope of this invention.

The following example will serve to illustrate the practice of the invention.

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Example 1

Rhodamine B Base (535 grams) is dissolved in 350 grams of glacial acetic acid, 78 grams of propionic acid, 30 grams of glycerine and 350 grams of ethyl alcohol.

The resulting composition has a specific gravity at 15° C. of approximately 1.025 and is stable on storage.

This formulation is fed into the ocean and the fluorescent dye detected as it flows with the current.

What is claimed is:

A visual indicating solution for producing a detectable color upon contact with water and which is stable on storage consisting essentially of about 40-50 parts of a fluorescent, relatively water and alcohol soluble basic dye dissolved in 100 parts of a mixture of glacial acetic acid, ethanol, glycerine and propionic acid, said solution having a specific gravity at 15° C. of 1.020-1.030.

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SAMUEL H. BLECH, *Primary Examiner.*

15 A. T. MEYERS, *Examiner.*

K. W. VERNON, M. WEINBLATT, *Assistant Examiner.*