

COLORING COMPOSITION, INK FOR INK JET, AND INK JET RECORDING METHOD

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a water-based coloring composition containing an oil soluble dye (especially magenta dye), and to an ink for an ink jet which contains the coloring composition, and to an ink jet recording method using the ink for the ink jet. In particular, the present invention relates to a coloring composition whose color reproduction (especially magenta color reproduction) is good and which is suited for water based inks for writing, water based printing inks, inks for information recording, and the like, and to an ink for an ink jet which is suitable for a thermal, piezo-electric, electric field, or acoustic ink jet method, and to an ink jet recording method.

[0003] 2. Description of the Related Art

[0004] In recent years, as use of computers has become more widespread, ink jet printers have become widely used not only in offices, but in homes as well, for printing on paper, film, cloth and the like. Oil based inks, water based inks, solid inks and the like are known as inks for ink jets. Among these, water based inks are advantageous from the standpoints of ease of production, usability, lack of odor, safety, and the like thereof, and therefore, water based inks are mainly used.

[0005] However, most water based inks use a water soluble dye which dissolves when in a molecular state. Thus, although there are great advantages with regard to transparency and color density, because the dye is water soluble, the water resistance thereof is poor. Problems arise in that when a water based ink is used for printing onto regular paper, bleeding occurs such that the quality of the printed product markedly deteriorates. Further, the light resistance is poor.

[0006] Water based inks using pigments or dispersed dyes in order to overcome these problems are proposed in, for example, Japanese Patent Application Laid-Open (JP-A) Nos. 56-157468, 4-18468, 8-183920, 10-110126, 10-195355 and the like.

[0007] However, with these water based inks, although the water resistance is improved to a certain extent, it is still insufficient. There are further problems in that the storage stability of the dispersion of the dispersed dye or pigment within the water based ink is lacking, and it is easy for clogging of the ink discharge ports to occur. Further, with these water based inks, generally, a sufficient hue cannot be obtained, and in particular, the hue of the cyan component is insufficient. Problems in color reproduction arise due to the insufficient color tone.

[0008] JP-A Nos. 58-45272, 6-340835, 7-268254, 7-268257, and 7-268260 disclose a method of encapsulating a dye in urethane or polyester dispersion particles.

[0009] However, in such cases, the color reproduction is insufficient due to the insufficient color tone. Further, the dispersion stability and water resistance of the dye encapsulating polymer substance, when a dye is encapsulated to a desired concentration, are not always sufficient.

[0010] JP-A Nos. 9-59552, 9-111163, 9-255887, and 10-36728 propose improving the color tone by using a colorant in which an aromatic diamine is coupled with a pyrazolotriazole.

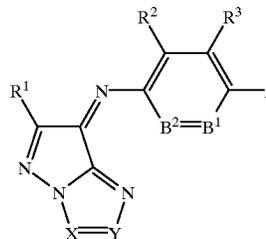
[0011] However, in these cases, there are problems in that the color tone changes depending on the type of image receiving paper, and the water resistance is insufficient.

SUMMARY OF THE INVENTION

[0012] The present invention overcomes the above-described drawbacks, and achieves the following objects. The present invention provides a coloring composition which has excellent dispersion stability of the coloring particulates, has excellent color forming property and excellent color tone (especially magenta color reproduction) when printing onto any type of paper regardless of the paper type, has excellent water resistance and light resistance, and is suitable for use as a water based ink for writing, a water based printing ink, an ink for information recording, or the like. The present invention also provides an ink for an ink jet which is suited for a thermal, piezo-electric, electric field or acoustic ink jet method, which does not cause clogging of a nozzle tip when printing is carried out using nozzles, and which has excellent color forming property and excellent color tone (especially magenta color reproduction) when printing onto any type of paper regardless of paper type, and has excellent water resistance and light resistance, and to an ink jet recording method.

[0013] In a first aspect of the present invention, there is provided an ink for an ink jet, said ink comprising a coloring composition comprising a dispersion medium and coloring particulates comprising a polymer which is selected from the group consisting of polyurethanes, polyesters, polyamides, polyureas and polycarbonates; and an oil-soluble dye represented by formula (1):

Formula (1)



[0014] wherein R¹ represents a hydrogen atom, aliphatic group, aromatic group, heterocyclic group, cyano, —OR¹¹, —SR¹², —CO₂R¹³, —OCOR¹⁴, —NR¹⁵R¹⁶, —CONR¹⁷R¹⁸, —SO₂R¹⁹, —SO₂NR²⁰R²¹, —NR²²CONR²³R²⁴, —NR²⁵CO₂R²⁶, —COR²⁷, —NR²⁸COR²⁹ or —NR³⁰SO₂R³¹, and R¹¹, R¹², R¹³, R¹⁴, R¹⁵, R¹⁶, R¹⁷, R¹⁸, R¹⁹, R²⁰, R²¹, R²², R²³, R²⁴, R²⁵, R²⁶, R²⁷, R²⁸, R²⁹, R³⁰ and R³¹ each represents independently a hydrogen atom, aliphatic group or aromatic group; wherein A represents —NR⁴R⁵ or a hydroxyl group, and R⁴ and R⁵ each represents independently a hydrogen atom, aliphatic group, aromatic group or heterocyclic group; wherein B¹ represents =C(R⁶)— or =N— and B² represents —C(R⁷)= or —N=; wherein R², R³, R⁶ and R⁷ each represents independently a hydrogen atom, halogen atom, aliphatic group, aromatic group, heterocyclic group, cyano,