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 an water-based coloring composition containing an oil soluble dye, an ink for ink-jet containing the coloring composition, and an ink-jet recording method using the ink for ink-jet. More specifically, the present invention relates to a coloring composition which is good in color reproducibility (in particular, color reproducibility of magenta) and is suitable for water based inks for writing, water based inks for printing, an ink for information recording and so on; an ink for ink-jet which is suitable for thermal, piezoelectric, electric field or acoustic ink-jet; and an ink-jet recording method.

[0003] 2. Description of the Related Art

[0004] As computers have become widely used in recent years, ink-jet printers too have been widely used for printing on paper, a film, cloth or the like not only in offices but also in homes. As ink for ink-jet, oil based inks, water based inks and solid inks are known. Among these inks, the water based inks are most advantageous in view of ease of production and handling thereof, smell, safety and so on. Thus, the water based inks is mainly used.

[0005] Many water based inks contain a water soluble dye which dissolves in water in the molecular state. Therefore, the water based inks are high in transparency and color density. However, the dye is water soluble; thus, the water based inks have poor water resistance, so that bleed is caused if printing is carried out with the inks on regular paper. As a result, problems that print quality deteriorates and light resistance is poor arise.

[0006] Thus, for example, Japanese Patent Application Laid-Open (JP-A) No. 56-157468, JP-A No. 4-18468, JP-A No. 10-110126 and JP-A No. 10-195355 suggest water based inks containing a pigment or a disperse dye in order to solve the above-mentioned problems.

[0007] However, with these water based inks, the water resistance is improved to a certain extent, it is still in sufficient. And the following problems arise: a pigment or a dispersed material of the disperse dye in the water based inks has insufficient storage stability so that an ink-jetting opening is easily blocked with the water based inks; and the water based inks in general have an insufficient hue and in particular have an insufficient magenta hue, so that color reproducibility deteriorates on the basis of the insufficient hue.

[0008] JP-A No. 58-45272, JP-A No. 6-340835, JP-A No. 7-268254, JP-A No. 7-268257 and JP-A No. 7-268260 suggest methods of encapsulating a dye in urethane or polyester dispersant particles.

[0009] These methods however have the following problems: color reproducibility is insufficient due to an insufficient color tone; and dispersion-stability and water resistance of the dye encapsulating polymer dispersant, when the dye is encapsulated at a desired concentration, are not necessarily sufficient.

[0010] JP-A No. 9-59552, JP-A No. 9-111163, JP-A No. 9-255887 and JP-A No. 10-36728 suggest methods of using a colorant obtained by coupling pyrazolotriazol with an aromatic diamine to improve a color tone.

[0011] These methods however have problems that the improved color tone changes in accordance with the type of image-receiving paper and water resistance is also insufficient.

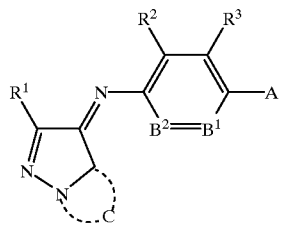
SUMMARY OF THE INVENTION

[0012] The present invention overcomes the above-mentioned problems and achieves the following object. The present invention provides a coloring composition which is superior in disperse-stability of coloring particulates, water resistance and light resistance, is not dependent on the type of paper, is good in color developability and a color tone (in particular, color reproducibility of magenta) at the time of printing on paper arbitrarily selected, and is suitable for use as water based inks for writing, water based inks for printing, an ink for information recording and so on. The present invention also provides an ink for ink-jet which is suitable for thermal, piezoelectric, electric field or acoustic ink-jet printing, witch does not cause blocking of the tip of a nozzle for printing, and which is good in color developability and a color tone (in particular, color reproducibility of magenta) when printing on any type of paper regardless of paper type, and is also superior in water resistance and light resistance; and an ink-jet recording method using the ink.

[0013] A first aspect of the present invention is an ink for ink-jet comprising: a coloring composition containing coloring particulates dispersed in a water based medium, the coloring particulates containing an oil soluble dye and an oil soluble polymer; and wherein the coloring composition has wavelength of maximum absorption (λ max(nm)) in the wavelength range from 510 to 560 nm and when the absorbance at the wavelength of maximum absorption (λ max(nm)) is regarded as 1, the absorbance at a wavelength (λ max+75 (nm)) is no more than 0.2 and the absorbance at a wavelength (λ max−75 (nm)) is no more than 0.4.

[0014] A second aspect of the present invention is an ink for ink-jet comprising: a coloring composition containing coloring particulates dispersed in a water based medium, the coloring particulates containing an oil soluble dye represented by the following formula (I) and a vinyl polymer having at least one of carboxyl groups and sulfonic acid groups as ionic groups:

Formula (I)



[0015] wherein R^1 represents a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, a cyano group, —OR^{11}, —SR^{12}, —CO_2R^{13}, —$OCOR^{14}$, —$NR^{15}R^{16}$,—$CONR^{17}R^{18}$, —SO_2R^{19},—$SO_2NR^{20}R^{21}$,—