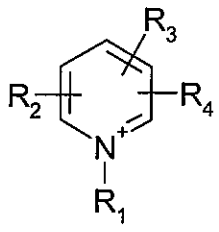
CLAIMS

[1] A slurry composition containing a cationic compound that comprises a nitrogen-containing heteroaromatic quaternary ammonium cationic group, a polymer dispersant, a nonaqueous solvent, a basic ceramic material, and a polyvinyl acetal resin.

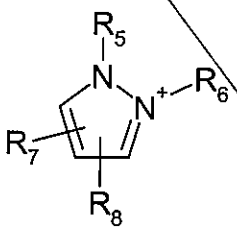
[2] The slurry composition according to claim 1, wherein the cationic group is a cationic group having quaternary ammonium in its aromatic ring.

[3] The slurry composition according to claim 1 or 2, wherein the cationic group is a cationic group having at least one structure selected from the group consisting of structures of pyridinium, pyrazolium, imidazolium, pyrimidinium, pyrazinium, pyridazinium and pyrrolium.

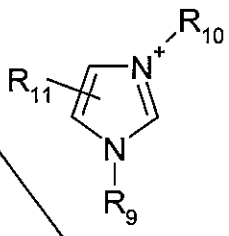
[4] The slurry composition according to any one of claims 1 to 3, wherein the cationic group is a cationic group selected from the group consisting of the cationic groups represented by General formulae (1), (2), and (3) below:



(1)



(2)



(3)

[In General formula (1), R_1 is a C_1 to C_4 alkyl group; and R_2, R_3 and R_4 are same or different, each represents a hydrogen atom or a C_1 to C_4 alkyl group which may have a hydroxyl group. In General formula (2), R_5 and R_6 are same or different, each represents a C_1 to C_4 alkyl group; and R_7 and R_8 are same or different, each represents a hydrogen atom or a C_1 to C_4 alkyl group which may have a hydroxyl group. In General formula (3), R_9 and R_{10} are same or different, each represents a C_1 to C_4 alkyl group; and R_{11} represents a hydrogen atom or a C_1 to C_4 alkyl group which may have a hydroxyl group.]

[5] The slurry composition according to any one of claims 1 to 4, wherein the cationic group is a cationic group represented by the General formula (3).

[6] The slurry composition according to any one of claims 1 to 5, wherein the cationic group is a cationic group represented by the General formula (3),

and the total number of the carbons of R_9 and R_{10} in the General formula (3) is in the range of 2 to 5.

[7] The slurry composition according to any one of claims 1 to 6, wherein the cationic group has a molecular weight in the range of 90 to 300.

[8] The slurry composition according to any one of claims 1 to 7, wherein the cationic compound is a salt of the cationic group and an anionic group, and the anionic group is an organic anionic group.

[9] The slurry composition according to any one of claims 1 to 8, wherein the anionic group is an anionic group of at least one acid selected from the group consisting of alkylsulfuric acid and aliphatic carboxylic acid.

[10] The slurry composition according to any one of claims 1 to 9, wherein the content of the cationic compound is not less than 0.05 weight parts and not more than 2.0 weight parts with respect to 100 weight parts of the basic ceramic material.

[11] The slurry composition according to any one of claims 1 to 10, wherein the polymer dispersant is an anionic polymer dispersant.

[12] The slurry composition according to any one of claims 1 to 11, wherein the basic ceramic material is barium titanate.

[13] The slurry composition according to any one of claims 1 to 12, wherein the polyvinyl acetal resin is a polyvinyl butyral resin.

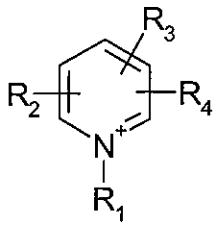
CLAIMS

[1] A slurry composition containing a cationic compound that comprises a nitrogen-containing heteroaromatic quaternary ammonium cationic group, a polymer dispersant, a nonaqueous solvent, a basic ceramic material, and a polyvinyl acetal resin.

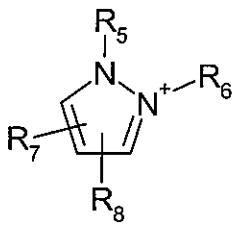
[2] The slurry composition according to claim 1, wherein the cationic group is a cationic group having quaternary ammonium in its aromatic ring.

[3] The slurry composition according to claim 1 or 2, wherein the cationic group is a cationic group having at least one structure selected from the group consisting of structures of pyridinium, pyrazolium, imidazolium, pyrimidinium, pyrazinium, pyridazinium and pyrrolium.

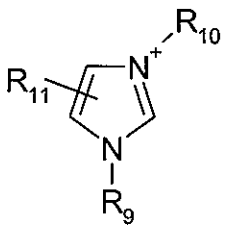
[4] The slurry composition according to any one of claims 1 to 3, wherein the cationic group is a cationic group selected from the group consisting of the cationic groups represented by General formulae (1), (2), and (3) below:



(1)



(2)



(3)

[In General formula (1), R_1 is a C_1 to C_4 alkyl group; and R_2, R_3 and R_4 are same or different, each represents a hydrogen atom or a C_1 to C_4 alkyl group which may have a hydroxyl group. In General formula (2), R_5 and R_6 are same or different, each represents a C_1 to C_4 alkyl group; and R_7 and R_8 are same or different, each represents a hydrogen atom or a C_1 to C_4 alkyl group which may have a hydroxyl group. In General formula (3), R_9 and R_{10} are same or different, each represents a C_1 to C_4 alkyl group; and R_{11} represents a hydrogen atom or a C_1 to C_4 alkyl group which may have a hydroxyl group.]

[5] The slurry composition according to any one of claims 1 to 4, wherein the cationic group is a cationic group represented by the General formula (3).

[6] The slurry composition according to any one of claims 1 to 5, wherein the cationic group is a cationic group represented by the General formula (3),

and the total number of the carbons of R_9 and R_{10} in the General formula (3) is in the range of 2 to 5.

[7] The slurry composition according to any one of claims 1 to 6, wherein the cationic group has a molecular weight in the range of 90 to 300.

[8] The slurry composition according to any one of claims 1 to 7, wherein the cationic group has a molecular weight in the range of 100 to 150.

[9] The slurry composition according to any one of claims 1 to 8, wherein the cationic compound is a salt of the cationic group and an anionic group, and the anionic group is an organic anionic group.

[10] The slurry composition according to any one of claims 1 to 9, wherein the anionic group is an anionic group of at least one acid selected from the group consisting of alkylsulfuric acid and aliphatic carboxylic acid.

[11] The slurry composition according to any one of claims 1 to 10, wherein the content of the cationic compound is not less than 0.05 weight parts and not more than 2.0 weight parts with respect to 100 weight parts of the basic ceramic material.

[12] The slurry composition according to any one of claims 1 to 11, wherein the content of the cationic compound is not less than 0.3 weight parts and not more than 1.2 weight parts with respect to 100 weight parts of the basic ceramic material.

[13] The slurry composition according to any one of claims 1 to 12, wherein the content of the cationic compound is not less than 0.01 weight parts and not more than 0.2 weight parts with respect to 1.0 weight part of the polyvinyl acetal resin.

[14] The slurry composition according to any one of claims 1 to 13, wherein the polymer dispersant is an anionic polymer dispersant.

[15] The slurry composition according to any one of claims 1 to 14, wherein the polymer dispersant has a weight average molecular weight of not less than 2000 and not more than 200000.

[16] The slurry composition according to any one of claims 1 to 15, wherein the basic ceramic material has an average particle diameter of not less than 5 nm and not more than 500 nm based on BET specific surface area.

[17] The slurry composition according to any one of claims 1 to 16, wherein the basic ceramic material is barium titanate.

[18] The slurry composition according to any one of claims 1 to 17, wherein the polyvinyl acetal resin is a polyvinyl butyral resin.

[19] The slurry composition according to any one of claims 1 to 18, further comprising a plasticizer selected from the group consisting of diester phthalate, diester adipate, and alkylene glycol diester.

[20] The slurry composition according to claim 19, wherein the content of the plasticizer is not less than 5 weight parts and not more than 40 weight parts with respect to 100 weight parts of the polyvinyl acetal resin.

[21] The slurry composition according to any one of claims 1 to 20, wherein the nonaqueous solvent is selected from the group consisting of alcohols and cellosolves.