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問1

1. A piezoelectric ceramic comprising lead zirconate titanate as a main component, wherein

the piezoelectric ceramic comprises crystal grains containing a complex oxide represented by (Pba-xBx)(TiyZr1-y)O3 as a main component and grain boundaries which are present between the crystal grains and in which Zn is unevenly distributed,

an element represented by B is at least one element selected from alkali metals consisting of Na, K, and Li, and

a, x, and y satisfy 0.95<=a<=1.02, 0<=x<=0.2, and 0.2<=y<=0.9, respectively.

2. The piezoelectric ceramic of Claim 1, wherein a Pb(ZnbM1c)O3-based complex oxide is dissolved as a first accessory component in the crystal grains.

3. A piezoelectric device comprising:

piezoelectric layers comprising the piezoelectric ceramic of Claim 1 or 2; and

internal electrode layers comprising Ag and Pd, wherein

the piezoelectric layers and the internal electrode layers are stacked alternately.

問2

[0002]

Oil cosmetics have high emollience and durable decorative effects. In particular, solid or semisolid oil make-up cosmetics are popular in terms of portability or each of use. However, an oil cosmetic contains an oil solution as a main component. For this reason, the user tends to feel stickiness with respect to the finished oil cosmetic. Further, for a solid or semisolid oil cosmetic formed by solidifying an oil solution using a solid oil, the user tends to pick it up poorly or feel heaviness when applying and expanding it.

Various kinds of oil cosmetics have been considered to solve these problems. Examples of such cosmetics include an oil cosmetic which contains a hollow resin powder having a particular particle diameter and a particular specific gravity and which is non-sticky and has high expandability (Patent Literature 1) and a solid cosmetic in which a porous powder and oil content are mixed in particular amounts and which is non-sticky and provides a good moist feeling (Patent Literature 2).

問3

A polyamide reverse osmosis membrane of the present invention is formed by graft-polymerizing a 2-methacryloyloxyethyl phospholylcholine (hereafter may be referred to as MPC) polymer on a polyamide thin-film and binding the polymer to the film. The MPC polymer bound to the polyamide thin-film is formed by graft-polymerizing MPC using reaction starting points present in the polyamide thin-film as starting points.

As used herein, "the reaction starting points present in the polyamide thin-film" refer to reaction active sites (reaction active groups) which, when forming a polyamide thin-film serving as the intermediate material of the polyamide reverse osmosis membrane of the present invention, are formed in that thin film. Examples of such reaction active sites include alkyl halide groups and acid halide groups. The polymerization of the MPC proceeds using multiple such reaction active groups as starting points, and a graft copolymer in which the multiple MPC polymers are bound to the polyamide thin-film is formed. In this way, the polyamide reverse osmosis membrane of the present invention is obtained.

問4

By adding dimethyl ether (DME) as a propellant to various aqueous aerosol coating undiluted solutions shown in Table 1, aqueous aerosol coating compositions of Examples 1 to 6 and comparative examples 1 and 2 were obtained. As shown in Table 1, the aqueous aerosol paint compositions of Examples 1 to 6 demonstrated good results with respect to both aerosolization and coating performance. Specifically, if a dispersion resin is used as a binder, it is possible to avoid or reduce (3 mass% or less in the aqueous aerosol coating undiluted solution) the use of a water-soluble organic solvent and thus to provide a substantially completely aqueous aerosol coating undiluted solution.

For the aqueous aerosol paint compositions of comparative examples 1 and 2, on the other hand, an appropriate pH range was not ensured in any of the aqueous aerosol coating undiluted solutions and thus these compositions had problems with respect to aerosolization and coating properties. It was also found that the aqueous aerosol coating undiluted solutions having a dispersion resin content of 46 mass% or more or 13 mass% or less decreased in coating properties.