can form a homogeneously cured film is demanded.

[0004]

In the past literatures, there has been reported technology in which deposition or gelation due to aggregation of a hydrolysate is prevented by carefully carrying out the hydrolysis under special conditions (see, for example, Patent Literatures 1 and 2). Furthermore, polymetalloxane has been reported, which stably and homogeneously exists in solutions, due to a specific substituent introduced in side chains in the polymer (see, for example, Patent Literature 3).

Citation List

Patent Literature

[0005]

Patent Literature 1: JP 1-129032 A

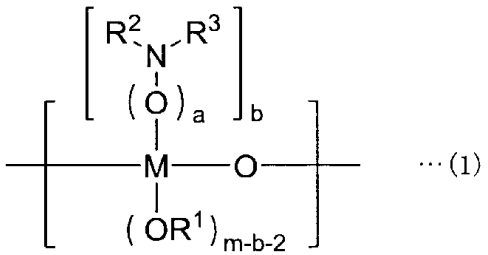
Patent Literature 2: JP 2015-3896 A

Patent Literature 3: WO2017/090512

Summary

[0005a]

In an aspect, there is provided a polymetalloxane comprising a constituent unit represented by the following general formula (1):



… (1)

wherein,

R^1 is a hydrogen atom or an alkyl group having 1 to 10 carbon atoms;

R^2 and R^3 are each independently a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an alicyclic alkyl group having 5 to 12 carbon atoms, an aromatic group having 6 to 30 carbon atoms, or an acyl group having 1 to 12 carbon atoms;

R^2 and R^3 are optionally linked together via a carbon-carbon saturated or a carbon-carbon unsaturated bond to form a ring structure;

a is an integer of 0 or 1;

M represents a metal atom selected from the group consisting of Al, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au, Tl, and Bi;

m is an integer indicating the valence of the metal atom M; and

b is an integer of 1 to (m-2).

[0005b]

In another aspect, there is provided a composition comprising the polymetalloxane as disclosed herein.

[0005c]

In another aspect, there is provided a cured film comprising the polymetalloxane as disclosed herein.

[0005d]

In another aspect, there is provided a cured film comprising the composition as disclosed herein.

[0005e]

In another aspect, there is provided a method of producing a cured film, comprising the step of heating the polymetalloxane as disclosed herein or the composition as disclosed herein.

[0005f]

In another aspect, there is provided a member comprising the cured film as

disclosed herein.

[0005g]

In another aspect, there is provided an electronic component comprising the member as disclosed herein.

[0005h]

In another aspect, there is provided a fiber comprising the polymetalloxane as disclosed herein.

[0005i]

In another aspect, there is provided a fiber comprising the composition as disclosed herein.

[0005j]

In another aspect, there is provided a method of producing a fiber, comprising the step of spinning the polymetalloxane as disclosed herein or the composition as disclosed herein into a fiber.

[0005k]

In another aspect, there is provided a binder for ceramic molding comprising the polymetalloxane as disclosed herein.

Technical Problem

[0006]

However, the method described in Patent Literature 1, as a method of hydrolyzing a metal alkoxide in a solvent, will result in precipitation due to aggregation of hydrolysates when water is added at a temperature of lower than 70°C or in an increased amount. In addition, because of low rate of the hydrolysis, numerous alkoxy groups will remain in the resulting polytitanoxane and the alkoxy group will be hydrolyzed by water in the air during formation of a coating film to be eliminated. Thus, the polytitanoxane described above will produce cracks, failing to form a homogeneous film.