CLAIMS

1. An insulating structure comprising a substrate and a circuit pattern formed on the substrate, wherein

the circuit pattern has a narrow width region having a narrow width pattern of a width of 30 nm or less and a wide width region having a wide width pattern of a width of greater than 100 nm in the same layer, and

the same insulating composition is formed within the narrow width pattern and within the wide width pattern, wherein

the insulating composition present within the narrow width pattern has resistance to hydrofluoric acid, and wherein

the insulating composition is obtainable from a coating composition containing a condensation reaction product derived from at least a polysiloxane compound derived from a silane compound represented by the following general formula (1):

$$R^1_nSiX^1_{4-n} \quad (1)$$

wherein, n represents an integer of 0 to 3, R^1 represents a hydrocarbon group having 1 to 10 carbon atoms, and X^1 represents a halogen atom, an alkoxy group having 1 to 6 carbon atoms, or an acetoxy group, the silane compound represented by the general formula (1) comprising at least a trifunctional silane compound in which n in general formula (1) is 1.

2. The insulating structure according to claim 1, wherein the film thickness of the insulating composition present within the wide with pattern is 1.5 μm to 4.0 μm.

3. The insulating structure according to claim 1, wherein the film thickness of the insulating composition present within the wide width pattern is 0.8 μm to 1.5 μm.

4. The insulating structure according to any of claims 1 to 3, wherein the insulating composition present within the wide width pattern does not have cracks.

5. The insulating structure according to any of claims 1 to 4, wherein the insulating composition present within the narrow width pattern does not have voids.

~~6. The insulating structure according to any of claims 1 to 5, wherein the insulating composition present within the narrow width pattern has resistance to hydrofluoric acid.~~

~~7~~6. The insulating structure according to any of claims 1 to ~~6~~5, wherein the depth of the narrow width pattern is 0.4 μm or more.

~~8~~7. The insulating structure according to claim ~~7~~6, wherein the depth of the narrow width pattern is 0.5 μm to 3 μm.

~~9~~8. The insulating structure according to claim ~~8~~7, wherein the depth of the narrow width pattern is 1 μm

to 2 μm.

~~10~~9. The insulating structure according to any of claims 1 to ~~9~~8, wherein the length of the narrow width pattern is 50 nm to 10 μm.

~~11~~10. The insulating structure according to any of claims 1 to ~~10~~9, wherein the narrow width pattern is a pattern of a width of 10 nm to 30 nm.

~~12~~11. The insulating structure according to any of claims 1 to ~~11~~10, wherein the wide width pattern is a pattern of a width of greater than 100 nm and up to 100 μm.

~~13~~12. The insulating structure according to any of claims 1 to ~~12~~11, wherein the substrate is composed of a semiconductor or insulator.

~~14~~13. The insulating structure according to any of claims 1 to ~~13~~12, wherein the insulating composition has a nanostructure of a particle diameter of 3 nm to 30 nm.

~~15~~14. An insulating structure comprising a substrate and a circuit pattern formed on the substrate, wherein

the circuit pattern has a narrow width region having a pattern of a width of 30 nm or less and a wide width region having a pattern of a width of greater than 100 nm within the same layer,

the same insulating composition is formed within the pattern having a width of 30 nm or less in the narrow width region and within the pattern of a width of greater than 100 nm in the wide width region, and

the insulating composition has a nanostructure of a particle diameter of 3 nm to 30 nm, wherein

the insulating composition present within the narrow width pattern has resistance to hydrofluoric acid, and wherein

the insulating composition is obtainable from a coating composition containing a condensation reaction product derived from at least a polysiloxane compound derived from a silane compound represented by the following general formula (1):

$$R^1_nSiX^1_{4-n} \quad (1)$$

wherein, n represents an integer of 0 to 3, R^1 represents a hydrocarbon group having 1 to 10 carbon atoms, and X^1 represents a halogen atom, an alkoxy group having 1 to 6 carbon atoms, or an acetoxy group, the silane compound represented by the general formula (1) comprising at least a trifunctional silane compound in which n in general formula (1) is 1.

~~16~~15. The insulating structure according to claim ~~14~~13 or ~~15~~14, wherein the ratio of the portion having the nanostructure in the insulating composition is 1% by weight to 60% by weight.

~~17~~16. The insulating structure according to any of claims ~~14~~13 to ~~16~~15, wherein the insulating composition is obtainable from a coating composition containing ~~contains~~ 50% by weight to 100% by weight of a condensation reaction product of ~~a~~ the polysiloxane compound

and a silica particles having an average primary particle diameter of 3 nm to 30 nm, and

the ratio of a hydrolytic condensation structure of at least one type of tetraalkoxysilane and at least one type of alkyl trialkoxysilane in the entire condensation reaction product is 40% by weight to 99% by weight.

~~18~~17. A production method of the insulating structure according to any of claims 1 to ~~17~~16, comprising:

a step for preliminarily forming patterns corresponding to the narrow width region and the wide width region on a substrate,

a step for coating a coating composition for forming the insulating composition on the patterns, and

a step for converting the coated coating composition to the insulating composition by heating.

~~19~~18. The insulating structure production method according to claim ~~18~~17, wherein the coating composition is a condensation reaction product solution comprising:

(I) a condensation reaction product obtained by a condensation reaction of a condensation component containing at least (i) 40% by weight to 99% by weight as the condensed amount thereof of a polysiloxane compound derived from a silane compound represented by the following general formula (1):

$$R^1_nSiX^1_{4-n} \quad (1)$$

(wherein, n represents an integer of 0 to 3, R^1 represents a hydrocarbon group having 1 to 10 carbon atoms, and X^1 represents a halogen atom, an alkoxy group having 1 to 6 carbon atoms, or an acetoxy group), and (ii) 1% by weight to 60% by weight of silica particles, and

(II) a solvent, and

the silane compound represented by the general formula (1) consists of two or more types of silane compounds comprising at least a tetrafunctional silane compound in which n in general formula (1) is 0 and a trifunctional silane compound in which n in general formula (1) is 1.

trifunctional silane compound in which n in general formula (1) is 1.