Patent Claims

1. An amorphous silicon forming composition comprising:

(a) a block copolymer comprising a linear and/or cyclic block A having a polysilane skeleton comprising 5 or more silicon and a block B having a polysilazane skeleton comprising 20 or more silicon, wherein at least one silicon in the block A and at least one silicon in the block B are connected by a single bond and/or a crosslinking group comprising silicon, and

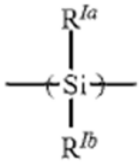
(b) a solvent,

wherein the ratio of the compounds other than the solvent is 1 to 96 mass percent.

2. The composition according to claim **1**, wherein

the block A comprises 5 or more repeating units selected from the group consisting of the following formulae (I-1) to (1-3):

(I-1)



(I-2)



(I-3)



(wherein R^{Ia}, R^{Ib}, and R^{Ic} are each independently hydrogen, halogen, C_{1-6} alkyl or C_{6-10} aryl), and

the block B comprises 20 or more repeating units selected from the group consisting of the following formulae (II-1) to (11-6):

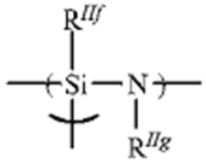
(II-1)



(II-2)



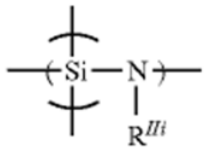
(II-3)



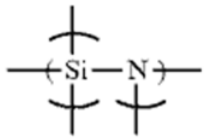
(II-4)



(II-5)



(II-6)



(wherein R^{IIa} to R^{IIi} are each independently hydrogen or C_{1-4} alkyl).

3. The composition according to claim **1**, wherein the mass average molecular weight of the block copolymer is 1,100 to 25,000.

4. The composition according to claim **1**, wherein the ratio of the number of N atoms containing in the block copolymer to that of Si atoms containing in the block copolymer is 0.9 to 95%.

5. The composition according to claim **2**, wherein the ratio of the total number of the repeating units of formulae (I-1) to (I-3) to that of the repeating units of the formulae (II-1) to (II-6) containing in the block copolymer is 0.3 to 114%.

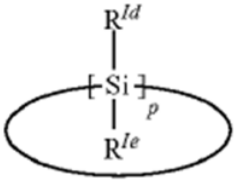
6. The composition according to claim **2**, wherein all of R^{Ia}, R^{Ib} and R^{Ic} in the block A are hydrogen.

7. The composition according to claim **2**, wherein all of R^{IIa} to R^{IIi} in the block B are hydrogen.

8. The composition according to claim **1**, wherein the block copolymer comprises a main chain comprising the block B and a side chain comprising the block A.

9. The composition according to claim **1**, wherein at least one of the block A is represented by the following formula (I-4):

(I-4)



wherein

R^{Id} and R^{Ic} are each independently hydrogen, halogen, C_{1-6} alkyl, C_{6-10} aryl or a single bond, provided that at least one of R^{Id} and R^{Ie} is a single bond, and

p is an integer of 5 or more.

10. The composition according to claim **1**, wherein between the block A and another block A, between the block B and another block B, or between the block A and the block B in the block copolymer is connected by a crosslinking group comprising silicon.

11. The composition according to claim **1**, wherein the relative dielectric constant of the solvent is 3.0 or less.

12. A method for producing an amorphous silicon film, comprising:

applying the composition according to claim **1** above a substrate to form a coating film, and

heating the coating film in a non-oxidizing atmosphere.

13. The method according to claim **12**, wherein light having the wavelength of 248 to 436 nm is irradiated after the formation of the coating film.

14. The method according to claim **12**, wherein the heating is performed at 200 to 1,000° C.

15. A method for manufacturing an electronic device, comprising the method according to claim **12**.

16. The composition according to claim **1**, wherein the ratio of the compounds other than the solvent is 2 to 60 mass percent.

17. The composition according to claim **1**, wherein components other than (a) and (b) contained in the whole composition are 10% or less based on the total mass.

18. The composition according to claim **1**, wherein components other than (a) and (b) contained in the whole composition are 5% or less based on the total mass.

19. The composition according to claim **1**, wherein the relative dielectric constant of the solvent is 2.5 or less.