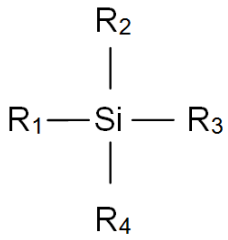
CLAIMS

1. A coating composition system for treating cellulosic articles comprising:

at least a first aqueous composition having a pH of at least 10 and comprising potassium silicate, wherein the potassium silicate is present in a range of from 1.5 to 32 % by weight, the molar ratio of silicon (Si) to potassium (K) of said potassium silicate is 1.2-2.1, and

at least a second aqueous composition comprising an emulsion of:

an alkoxy silane compound of the general formula I:



Formula I

wherein

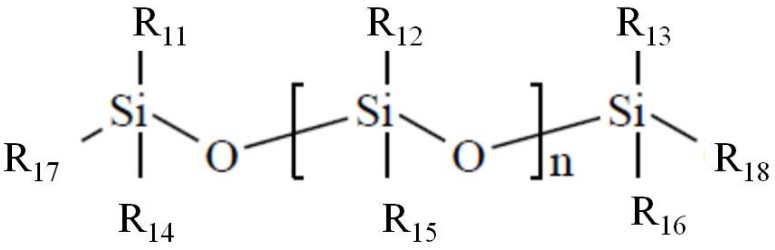
R1 is selected from the group consisting of straight and branched, saturated and unsaturated alkyls and aryls, which group is optionally substituted with aromatic, halogen and/or heteroatom functionalities and organo-functional groups;

R2 and R3 are independently a straight or branched alkoxy group; and

R4 is a straight or branched alkoxy group or is selected from the group consisting of straight and branched, saturated and unsaturated alkyls and aryls, which group is optionally substituted with aromatic, halogen and/or heteroatom functionalities and organo-functional groups;

and/or

a siloxane compound of the general formula II:



Formula II

wherein

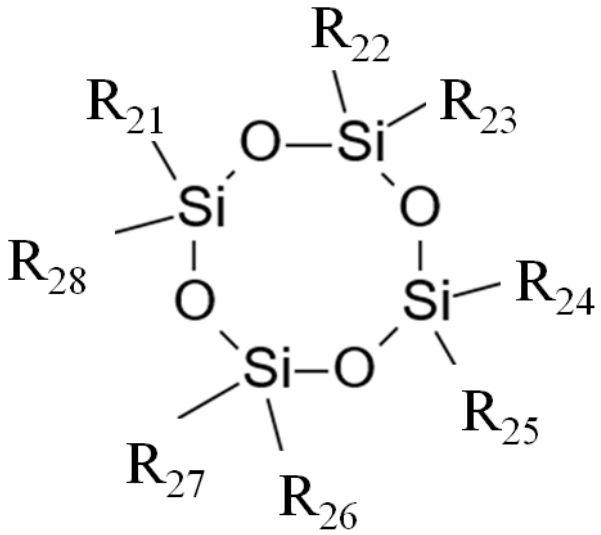
R11, R12, R13, R14, R15 and R16, independently are selected from the group consisting of straight and branched, saturated and unsaturated alkyls and aryls, which group is optionally substituted with aromatic, halogen and/or heteroatom functionalities and organo-functional groups;

R17 and R18 are functional groups independently selected from the group consisting of hydroxyl or amino; and

n is 0-20;

and /or

a siloxane compound of the general formula III



Formula III

wherein

R21, R22, R23, R24, R25, R26, R27 and R28 independently are selected from the group consisting of straight and branched, saturated and unsaturated alkyls and aryls, which group is

optionally substituted with aromatic, halogen and/or heteroatom functionalities and organo-functional groups.

2. The coating composition system according to claim 1, wherein the molar ratio of Si to K of said potassium silicate of the first aqueous composition is between 1.2 and 1.8.

3. The coating composition system according to claim 1, wherein the potassium silicate of the first aqueous composition is present in a range of 4-30% by weight.

4. The coating composition system according to claim 1, further comprising a penetration aiding agent selected from alcohol(s), ester(s), ether(s), and amine(s), and any combination thereof.

5. The coating composition system according to claim 1, wherein the first aqueous composition further comprises a surfactant selected from nonionic surfactants, rosin acid and abeitic acid, and their salts, and any combination thereof.

6. The coating composition system according to claims 1, wherein the first aqueous composition further comprises sodium silicate.

7. The coating composition system according to claim 1, wherein R_1 is a branched or straight, saturated or unsaturated C_{1-18}-alkyl group.

8. The coating composition system according to claim 1, wherein R_2, R_3 and R_4 independently are straight or branched C_{1-6}-alkoxy group.

9. The coating composition system according to claim 1, wherein R11, R12, R13, R14, R15, and R16 independently are branched or straight, saturated or unsaturated C_{1-6}-alkyl group.

10. The coating composition system according to claim 1, wherein R21, R22, R23, R24, R25, R26, R27 and R28 independently are branched or straight, saturated or unsaturated C_{1-6}-alkyl group.

11. The coating composition system according to claim 1, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 0.1 to 60 % by weight, of the second composition.

12. The coating composition system according to claim 1, wherein said alkoxy silane compound and/or siloxane compound(s) are selected from the group consisting of (tri)alkoxysilane and alkylsiloxanes.

13. The coating composition system according to claim 1, wherein the second aqueous composition further comprises a vinyl compound.

14. A method for treating cellulosic articles comprising the steps of:

providing a cellulosic article;

providing the coating composition system according to claim 1, including a first and a second aqueous composition; and

sequentially applying on said cellulosic article the first aqueous composition and the second aqueous composition of said coating composition system.

15. The method according to claim 14, wherein the first aqueous coating of the coating composition system is applied using a method selected from pressure impregnation, brush treatment, soaking, spraying, dipping, injection and roller coating.

16. Cellulosic article comprising the coating composition system according to claim 1.

17. Cellulosic article treated by the method according to claim 14.

18. The coating composition system according to claim 2, wherein the molar ratio of Si to K of said potassium silicate of the first aqueous composition is 1.2-1.65.

19. The coating composition system according to claim 2, wherein the molar ratio of Si to K of said potassium silicate of the first aqueous composition is 1.3-1.65.

20. The coating composition system according to claim 4, wherein the penetration aiding agent is a polyol selected from the group diol, triol, tetrol and sugar alcohol, and any combination thereof.

21. The coating composition system according to claim 5, wherein the nonionic surfactants are selected from alcohol ethoxylates, alkylphenol ethoxylates, phenol ethoxylates, amide ethoxylates, glyceride ethoxylates (soya bean oil and castor oil ethoxylates), fatty acid ethoxylates, and fatty amine ethoxylates and any combination thereof.

22. The coating composition system according to claims 6, wherein the first aqueous composition further comprises sodium silicate in a ratio of molar concentration of the sodium to potassium of up to 9.

23. The coating composition system according to claims 6, wherein the first aqueous composition further comprises sodium silicate in a ratio of molar concentration of the sodium to potassium of up to 5.

24. The coating composition system according to claims 6, wherein the first aqueous composition further comprises sodium silicate in a ratio of molar concentration of the sodium to potassium of up to 3.

25. The coating composition system according to claim 7, wherein R_1 is a branched or straight, saturated or unsaturated C_{4-12}-alkyl group.

26. The coating composition system according to claim 9, wherein R11, R12, R13, R14, R15, and R16 independently are branched or straight, saturated or unsaturated C_{1-3}-alkyl group.

27. The coating composition system according to claim 10, wherein R21, R22, R23, R24, R25, R26, R27 and R28 independently are branched or straight, saturated or unsaturated C_{1-3}-alkyl group.

28. The coating composition system according to claim 11, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 0.1 to 60 % by weight of the second composition.

29. The coating composition system according to claim 11, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 0.3 to 20 % by weight of the second composition.

30. The coating composition system according to claim 11, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 0.3 to 18 % by weight of the second composition.

31. The coating composition system according to claim 11, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 0.4 to 15 % by weight of the second composition.

32. The coating composition system according to claim 11, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 1 to 13 % by weight of the second composition.

33. The coating composition system according to claim 11, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 2 to 12 % by weight of the second composition.

34. The coating composition system according to claim 11, wherein said second composition comprises said alkoxy silane compound and/or siloxane compound(s) in an amount of 2.5 to 12 % by weight of the second composition.

35. The coating composition system according to claim 12, wherein said alkoxy silane compound and/or siloxane compound(s) are selected from

triethoxyoctylsilane, dimethyl siloxane, and octamethylcyclotetrasiloxane, and any combination thereof.

36. The coating composition system according to claim 13, wherein the second aqueous composition further comprises a vinyl acrylate.