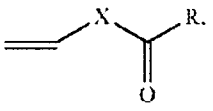
CLAIMS

1. A solventborne binder comprising:

a copolymer obtained by reacting a composition comprising a monomer mixture and an organic solvent, the monomer mixture comprising:

(i) 70 to 97 percent by weight of an ethylenically unsaturated monomer comprising two or more of an ester of lower alkyl (C_1-C_4) (meth)acrylic acid, vinyl acetate, or styrene; and

(ii) 3 to 30 percent by weight of a vinyl ester monomer having a formula:



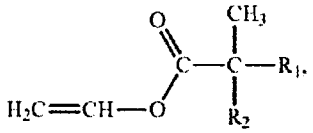
wherein

R is a linear or branched alkyl group having 2 to 18 carbon atoms, an aromatic group having 6 to 12 carbon atoms, or R is bonded to X to form a 5- to 7-member ring, and X is O,

wherein the percent by weight is based on the total weight of the monomers (i) and (ii) in the monomer mixture and monomers (i) and (ii) are different from each other, and wherein the composition is essentially free of butanol.

2. The solventborne binder of claim 1, wherein the ethylenically unsaturated monomer (i) comprises an ester of lower alkyl (C_1-C_4) (meth)acrylic acid and vinyl acetate.

3. The solventborne binder of claim 1, wherein the vinyl ester monomer (ii) has a formula:



wherein

R_1 and R_2 are alkyl groups which together contain 6-8 carbon atoms.

4. The solventborne binder of claim 1, comprising 50% solids by weight or more of the copolymer in the organic solvent, based on the total weight of the solventborne binder.

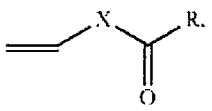
5. The solventborne binder of claim 4, wherein the copolymer has a weight average molecular weight of 15,000 to 25,000.

6. A solventborne binder comprising:

a copolymer obtained by reacting a composition comprising a monomer mixture and an organic solvent, the monomer mixture comprising:

(i) 70 to 97 percent by weight of ethylenically unsaturated monomers comprising: (a) a vinyl acetate monomer, and (b) an ethylenically unsaturated monomer other than vinyl acetate; and

(ii) 3 to 30 percent by weight of a vinyl ester monomer having a formula:



(I)

wherein

R is a linear or branched alkyl group having 2 to 18 carbon atoms, an aromatic group having 6 to 12 carbon atoms, or R is bonded to X to form a 5- to 7-member ring, and X is O,

wherein the percent by weight is based on the total weight of the monomers (i)(a), (i)(b), and (ii) in the monomer mixture, and monomers (i)(a), (i)(b), and (ii) are different from each other, and wherein the composition is essentially free of butanol.

7. The solventborne binder of claim 6, wherein the ethylenically unsaturated monomer (i) comprises:

(a) 60 to 97 percent by weight of the vinyl acetate monomer; and

(b) 3 to 40 percent by weight of the ethylenically unsaturated monomer other than vinyl acetate,

wherein the percent by weight is based on the total weight of the monomers (i)(a) and (i)(b).

8. The solventborne binder of claim 6, comprising:

(i) 85 to 95 percent by weight of the ethylenically unsaturated monomer; and

(ii) 5 to 15 percent by weight of the vinyl ester monomer having the formula (I),

wherein percent by weight is based on the total weight of the monomers (i) and (ii) in the monomer mixture.

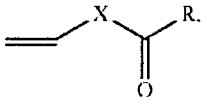
9. The solventborne binder of claim 6, comprising 50% solids by weight or more of the copolymer in the organic solvent based on the total weight of the solventborne binder, wherein the solventborne binder is essentially free of butanol.

10. An intumescent coating composition comprising:

(A) a solventborne binder comprising a copolymer obtained by reacting a composition comprising a monomer mixture and an organic solvent, the monomer mixture comprising:

(i) 70 to 97 percent by weight of an ethylenically unsaturated monomer comprising two or more of an ester of lower alkyl (C_1-C_4) (meth)acrylic acid, vinyl acetate, or styrene, and

(ii) 3 to 30 percent by weight of a vinyl ester monomer having a formula (I):



(I)

wherein

R is a linear or branched alkyl group having 2 to 18 carbon atoms, an aromatic group having 6 to 12 carbon atoms, or R is bonded to X to form a 5- to 7-member ring, and X is O,

wherein percent by weight is based on the total weight of the monomers (ii) and (ii) in the monomer mixture, and monomers (i) and (ii) are different from each other, and

wherein the composition is essentially free of butanol;

(B) an acid source;

(C) a carbon source; and

(D) a gas source.

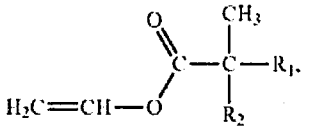
11. The intumescent coating of claim 10, wherein the solventborne binder (A) comprises:

(i) 85 to 95 percent by weight of the ethylenically unsaturated monomer; and

(ii) 5 to 1.5 percent by weight of the vinyl ester monomer having the formula (I),

wherein percent by weight is based on the total weight of the monomers (i) and (ii) in the monomer mixture.

12. The intumescent coating composition of claim 10, wherein the vinyl ester monomer (ii) of the solventborne binder (A) has a formula (II) of:



(II)

wherein

R_1 and R_2 are alkyl groups which together contain 6-8 carbon atoms.

13. The intumescent coating composition of claim 10, wherein the ethylenically unsaturated monomer (i) of the solventborne binder (A) comprises:

(i)(a) 60 to 97 percent by weight of the vinyl acetate monomer; and

(i)(b) 3 to 40 percent by weight of monomers of the ester of lower alkyl (C_1-C_4) (meth)acrylic acid or styrene.

wherein the percent by weight is based on the total weight of the monomers (i)(a) and (i)(b).

14. The intumescent coating composition of claim 10, wherein the organic solvent of the solventborne binder (A) has a boiling point of at least 120° C.

15. The intumescent coating composition of claim 10, wherein the solventborne binder (A) comprises 50% solids by weight or more of the copolymer in the organic solvent based on the total weight of the solventborne binder (A), wherein the solventborne binder is essentially free of butanol.

16. The intumescent coating composition of claim 10, comprising:

(A) 20 to 30 weight percent of the solventborne binder;

(B) 5 to 40 weight percent of the acid source;

(C) 0.1 to 20 weight percent of the carbon source; and

(D) 3 to 20 weight percent of the gas source.

wherein weight percent is based on the total weight of the coating composition.

17. The intumescent coating composition of claim 16, further comprising 10 to 15 weight percent of a liquid carrier, wherein the coating composition has a solids by weight of 75% or greater, based on the total weight of the coating composition.

18. The intumescent coating composition of claim 10, wherein the coating composition, following application to a substrate, achieves a pull-off adhesion for a 1000 pin OFT coating of greater than 5 MPa.

19. The intumescent coating composition of claim 10, wherein the coating composition, following application to a substrate, achieves a max dry film thickness of greater than 1200 μm for a single coat.

20. A substrate coated at least in part with the intumescent coating composition of claim 10.

21. The solventborne binder of claim 1, wherein the organic solvent has a boiling point of at least 120° C.

22. The solventborne binder of claim 6, wherein the ethylenically unsaturated monomer other than vinyl acetate, component (i)(b), comprises an ester of lower alkyl (C_1-C_4) (meth)acrylic acid, styrene, or a combination thereof.