

CLAIMS:

1. An aqueous flame retardant dispersion comprising
water;
a brominated flame retardant which has an average particle size of about 20 μm or less,
wherein the brominated flame retardant contains aromatically-bound bromine and
is selected from a) brominated styrenic polymers which have weight average
molecular weights of about 650 to about 950,000 and a bromine content of about
60 wt% or more, and/or b) a brominated anionic chain transfer vinyl aromatic
polymer which contains about 70 wt% or more bromine;
at least one dispersant;
at least one wetting agent; and
at least one thickener;
wherein the flame retardant dispersion contains about 25 wt% or more brominated flame
retardant, based on the total weight of the dispersion.
2. A flame retardant dispersion as in Claim 1 wherein the brominated flame retardant
is
 - A) a brominated styrenic polymer which is
 - i) a brominated styrenic polymer having a weight average molecular weight of about
100,000 to about 950,000, and/or a bromine content of about 60 wt% to about 71
wt%;
 - ii) a brominated anionic styrenic polymer having a weight average molecular weight of
about 8,000 to about 50,000, and/or a bromine content of about 60 wt% to about 72
wt%; and/or
 - iii) a brominated anionic styrenic polymer having a weight average molecular weight
of about 650 to about 4000, and/or a bromine content of about 60 wt% to about 77
wt%; and/or
 - B) a brominated anionic chain transfer vinyl aromatic polymer having a weight average
molecular weight of about 1000 to about 21,000, and/or a bromine content of about 70
wt% to about 79 wt%.

3. A flame retardant dispersion as in Claim 1 or 2 wherein the brominated flame retardant has an average particle size of about 10 μm or less and/or wherein the brominated flame retardant was subjected to particle size reduction with a jet mill.

4. A flame retardant dispersion as in any of Claims 1-3 wherein the flame retardant dispersion contains about 50 wt% or more brominated flame retardant, based on the total weight of the dispersion.

5. A process for forming an aqueous flame retardant dispersion, which process comprises combining

water;

a brominated flame retardant which has an average particle size of about 20 μm or less, wherein the brominated flame retardant contains aromatically-bound bromine and is selected from a) brominated styrenic polymers which have weight average molecular weights of about 650 to about 950,000 and a bromine content of about 60 wt% or more, and/or b) a brominated anionic chain transfer vinyl aromatic polymer which contains about 70 wt% or more bromine;

at least one dispersant;

at least one wetting agent; and

at least one thickener;

wherein the flame retardant dispersion contains about 25 wt% or more brominated flame retardant, based on the total weight of the dispersion.

6. A process as in Claim 5 wherein the brominated flame retardant is

A) a brominated styrenic polymer which is

i) a brominated styrenic polymer having a weight average molecular weight of about 100,000 to about 950,000, and/or a bromine content of about 60 wt% to about 71 wt%;

ii) a brominated anionic styrenic polymer having a weight average molecular weight of about 8,000 to about 50,000, and/or a bromine content of about 60 wt% to about 72 wt%; and/or

iii) a brominated anionic styrenic polymer having a weight average molecular weight of about 650 to about 4000, and/or a bromine content of about 60 wt% to about 77 wt%; and/or

B) a brominated anionic chain transfer vinyl aromatic polymer having a weight average molecular weight of about 1000 to about 21,000, and/or a bromine content of about 70 wt% to about 79 wt%.

7. A process as in Claim 5 or 6 wherein the brominated flame retardant has an average particle size of about 10 μm or less and/or wherein the brominated flame retardant was subjected to particle size reduction with a jet mill.

8. A process as in any of Claims 5-7 wherein the flame retardant dispersion contains about 50 wt% or more brominated flame retardant, based on the total weight of the dispersion.

9. A coating composition comprising
water;
a brominated flame retardant which has an average particle size of about 20 μm or less, wherein the brominated flame retardant contains aromatically-bound bromine and is selected from a) brominated styrenic polymers which have weight average molecular weights of about 650 to about 950,000 and a bromine content of about 60 wt% or more, and/or b) a brominated anionic chain transfer vinyl aromatic polymer which contains about 70 wt% or more bromine;
at least one dispersant;
at least one wetting agent;
at least one thickener;
at least one flame retardant synergist; and
at least one coating resin;
wherein the coating composition contains about 4 wt% or more brominated flame retardant, based on the total weight of the coating composition.

10. A coating composition as in Claim 9 wherein the brominated flame retardant is
A) a brominated styrenic polymer which is
i) a brominated styrenic polymer having a weight average molecular weight of about 100,000 to about 950,000, and/or a bromine content of about 60 wt% to about 71 wt%;

- ii) a brominated anionic styrenic polymer having a weight average molecular weight of about 8,000 to about 50,000, and/or a bromine content of about 60 wt% to about 72 wt%; and/or
 - iii) a brominated anionic styrenic polymer having a weight average molecular weight of about 650 to about 4000, and/or a bromine content of about 60 wt% to about 77 wt%; and/or
 - B) a brominated anionic chain transfer vinyl aromatic polymer having a weight average molecular weight of about 1000 to about 21,000, and/or a bromine content of about 70 wt% to about 79 wt%.
11. A coating composition as in Claim 9 or 10 wherein the brominated flame retardant has an average particle size of about 10 μm or less and/or wherein the brominated flame retardant was subjected to particle size reduction with a jet mill.
12. A coating composition as in any of Claims 9-11 wherein the coating composition contains about 10 wt% or more brominated flame retardant, based on the total weight of the coating composition.
13. A coating composition as in any of Claims 9-12 wherein the synergist is selected from antimony trioxide, antimony pentoxide, sodium antimonate, potassium antimonate, iron oxide, zinc borate, zinc oxide, and zinc stannate.
14. A coating composition as in any of Claims 9-13 which contains about 3 wt% or more flame retardant synergist, based on the total weight of the coating composition.
15. A coating composition as in any of Claims 9-14 wherein the coating resin is polyvinyl chloride, a copolymer of polyvinyl chloride, or an acrylic copolymer.
16. A process for forming a coating composition, which process comprises combining water;
a brominated flame retardant which has an average particle size of about 20 μm or less, wherein the brominated flame retardant contains aromatically-bound bromine and is selected from a) brominated styrenic polymers which have weight average molecular weights of about 650 to about 950,000 and a bromine content of about 60 wt% or more, and/or b) a brominated anionic chain transfer vinyl aromatic polymer which contains about 70 wt% or more bromine;

- at least one dispersant;
- at least one wetting agent;
- at least one thickener;
- at least one flame retardant synergist; and
- at least one coating resin;

wherein the coating composition contains about 4 wt% or more brominated flame retardant, based on the total weight of the coating composition.

17. A process as in Claim 16 wherein the brominated flame retardant is

A) a brominated styrenic polymer which is

- i) a brominated styrenic polymer having a weight average molecular weight of about 100,000 to about 950,000, and/or a bromine content of about 60 wt% to about 71 wt%;
- ii) a brominated anionic styrenic polymer having a weight average molecular weight of about 8,000 to about 50,000, and/or a bromine content of about 60 wt% to about 72 wt%; and/or
- iii) a brominated anionic styrenic polymer having a weight average molecular weight of about 650 to about 4000, and/or a bromine content of about 60 wt% to about 77 wt%; and/or

B) a brominated anionic chain transfer vinyl aromatic polymer having a weight average molecular weight of about 1000 to about 21,000, and/or a bromine content of about 70 wt% to about 79 wt%.

18. A process as in Claim 16 or 17 wherein the brominated flame retardant has an average particle size of about 10 μm or less and/or wherein the brominated flame retardant was subjected to particle size reduction with a jet mill.

19. A process as in any of Claims 16-18 wherein the synergist is selected from antimony trioxide, antimony pentoxide, sodium antimonate, potassium antimonate, iron oxide, zinc borate, zinc oxide, and zinc stannate.

20. A process as in any of Claims 16-19 wherein the coating composition contains about 3 wt% or more flame retardant synergist, based on the total weight of the coating composition.

21. A process as in any of Claims 16-20 wherein the coating resin is polyvinyl chloride, a copolymer of polyvinyl chloride, or an acrylic copolymer.

22. A process as in any of Claims 16-21 wherein the coating composition contains about 10 wt% or more brominated flame retardant, based on the total weight of the coating composition.

23. A process for coating textile substrates, which process comprises contacting a textile substrate and a coating composition to form a coated textile substrate, wherein the coating composition comprises

water;

a brominated flame retardant which has an average particle size of about 20 μm or less, wherein the brominated flame retardant contains aromatically-bound bromine and is selected from a) brominated styrenic polymers which have weight average molecular weights of about 650 to about 950,000 and a bromine content of about 60 wt% or more, and/or b) a brominated anionic chain transfer vinyl aromatic polymer which contains about 70 wt% or more bromine;

at least one dispersant;

at least one wetting agent;

at least one thickener;

at least one flame retardant synergist; and

at least one coating resin;

wherein the coating composition contains about 4 wt% or more brominated flame retardant, based on the total weight of the coating composition.

24. A process as in Claim 23 wherein the coating composition is applied to a textile substrate by knife coating.

25. A process as in Claim 23 or 24 wherein the brominated flame retardant is

A) a brominated styrenic polymer which is

i) a brominated styrenic polymer having a weight average molecular weight of about 100,000 to about 950,000, and/or a bromine content of about 60 wt% to about 71 wt%;

- ii) a brominated anionic styrenic polymer having a weight average molecular weight of about 8,000 to about 50,000, and/or a bromine content of about 60 wt% to about 72 wt%; and/or
 - iii) a brominated anionic styrenic polymer having a weight average molecular weight of about 650 to about 4000, and/or a bromine content of about 60 wt% to about 77 wt%; and/or
- B) a brominated anionic chain transfer vinyl aromatic polymer having a weight average molecular weight of about 1000 to about 21,000, and/or a bromine content of about 70 wt% to about 79 wt%.
26. A process as in any of Claims 23-25 wherein the brominated flame retardant has an average particle size of about 10 μm or less and/or wherein the brominated flame retardant was subjected to particle size reduction with a jet mill.
27. A process as in any of Claims 23-26 wherein the synergist is selected from antimony trioxide, antimony pentoxide, sodium antimonate, potassium antimonate, iron oxide, zinc borate, zinc oxide, and zinc stannate.
28. A process as in any of Claims 23-27 wherein the coating composition contains about 3 wt% or more flame retardant synergist, based on the total weight of the coating composition.
29. A process as in any of Claims 23-28 wherein the coating resin is polyvinyl chloride, a copolymer of polyvinyl chloride, or an acrylic copolymer.
30. A process as in any of Claims 23-29 wherein the coating composition contains about 10 wt% or more brominated flame retardant, based on the total weight of the coating composition.
31. Any of claims 2, 6, 10, 17, or 25, wherein the brominated flame retardant is a brominated styrenic polymer having a weight average molecular weight of about 100,000 to about 950,000, and/or a bromine content of about 60 wt% to about 71 wt%.
32. Any of claims 2, 6, 10, 17, or 25, wherein the brominated flame retardant is a brominated anionic styrenic polymer having a weight average molecular weight of about 8,000 to about 50,000, and/or a bromine content of about 60 wt% to about 72 wt%.

33. Any of claims 2, 6, 10, 17, or 25, wherein the brominated flame retardant is a brominated anionic styrenic polymer having a weight average molecular weight of about 650 to about 4000, and/or a bromine content of about 60 wt% to about 77 wt%.

34. Any of claims 2, 6, 10, 17, or 25, wherein the brominated flame retardant is a brominated anionic chain transfer vinyl aromatic polymer having a weight average molecular weight of about 1000 to about 21,000, and/or a bromine content of about 70 wt% to about 79 wt%.