Claims:

1. A method of making a filter media comprising a plurality of fine fibers, the method comprising:

providing a polymer component, wherein the polymer component comprises a 4-vinyl pyridine-containing polymer;

providing a solvent that does not complex with 4-vinyl pyridine;

providing an epoxy, wherein the epoxy is at least difunctional;

combining the polymer component, the solvent, and the epoxy to form a composition and electrospinning the mixture to form the plurality of fine fibers out of the composition, such that the entirety of each fiber is prepared from the composition;

storing the plurality of fine fibers for at least one day in conditions having an ambient temperature of up to 40°C, wherein the 4-vinyl pyridine-containing polymer and the epoxy crosslink in the plurality of fine fibers during storage; and

forming a filter media comprising the plurality of fine fibers without increasing the temperature of the plurality of fine fibers above 40°C.

2. The method of claim 1, wherein the polymer component, the solvent, and the epoxy are combined and the plurality of fibers are formed without increasing the temperature of the composition above room temperature, and wherein the filter media comprising the plurality of fine fibers is formed without increasing the temperature of the plurality of fine fibers above room temperature.

3. The method of claim 1, wherein combining the polymer component, the solvent, and the epoxy to form a composition and forming a plurality of fibers out of the composition are simultaneous.

4. The method of claim 1, wherein combining the polymer component, the solvent, and the epoxy to form a composition and forming a plurality of fibers out of the composition comprises:

mixing the polymer component, the solvent, and the epoxy;

allowing the 4-vinyl pyridine-containing polymer and epoxy to react; and

removing at least a portion of the solvent.

5. The method of claim 1, wherein the solvent comprises ethanol.

6. The method of claim 1, wherein the solvent comprises an aprotic solvent.

7. The method of claim 1, wherein the 4-vinyl pyridine-containing polymer comprises a poly(4-vinyl pyridine) homopolymer, a 4-vinyl pyridine copolymer, or a mixture thereof.

8. The method of claim 1, wherein the polymer component further comprises a nylon, a polyamide terpolymer, polyvinyl butyral (PVB), polyvinyl alcohol (PVA), or a polyurethane, or a combination thereof.

9. The method of claim 1, wherein the epoxy comprises 1,4-butanediol diglycidyl ether, bisphenol A diglycidyl ether, a bisphenol F epoxy resin, a bisphenol A/F epoxy resin, a modified bisphenol A epoxy resin, a brominated epoxy resin, an epoxy novolac resin, an epoxy phenol novolac resin, an epoxy cresol novolac resin, a difunctional cycloaliphatic epoxy resin, or a glycidyl amine-type multifunctional epoxy resin, or a combination thereof.

10. The method of claim 1, wherein the polymer component comprises at least 20 wt-% of 4-vinyl pyridine-containing polymer based on polymer solids.

11. A method of making a filter media comprising a coated fine fiber, the method comprising:

providing a polymer component, wherein the polymer component comprises a 4-vinyl pyridine-containing polymer;

providing a solvent that does not complex with 4-vinyl pyridine;

providing an epoxy, wherein the epoxy is at least difunctional;

providing a fiber;

combining the polymer component, the solvent, and the epoxy to form a composition, and coating the fiber with the composition to form a coated fiber;

storing the coated fiber for at least one day in conditions having an ambient temperature of up to 40°C, wherein the 4-vinyl pyridine-containing polymer and the epoxy crosslink in the coated fiber during storage; and

forming a filter media comprising the coated fiber without increasing the temperature of the coated fiber above 40°C.

12. The method of claim 11, wherein the polymer component, the solvent, and the epoxy are combined, the 4-vinyl pyridine-containing polymer and the epoxy react, and the fiber is coated without increasing the temperature of the composition or the temperature of the fiber above room temperature, and wherein the filter media comprising the coated fiber is formed without increasing the temperature of the coated fiber above room temperature.

13. The method of claim 11, wherein combining the polymer component, the solvent, and the epoxy to form a composition and coating the fiber with the composition are simultaneous.

14. The method of claim 11, wherein combining the polymer component, the solvent, and the epoxy to form a composition and coating the fiber with the composition comprises:

mixing the polymer component, the solvent, and the epoxy;

allowing the 4-vinyl pyridine-containing polymer and epoxy to react; and

removing at least a portion of the solvent.

15. The method of claim 11, wherein the solvent comprises ethanol.

16. The method of claim 11, wherein the solvent comprises an aprotic solvent.

17. The method of claim 11, wherein the 4-vinyl pyridine-containing polymer comprises a poly(4-vinyl pyridine) homopolymer, a 4-vinyl pyridine copolymer, or a mixture thereof.

18. The method of claim 11, wherein the polymer component further comprises a nylon, a polyamide terpolymer, polyvinyl butyral (PVB), polyvinyl alcohol (PVA), or a polyurethane, or a combination thereof.

19. The method of claim 11, wherein the epoxy comprises 1,4-butanediol diglycidyl ether, bisphenol A diglycidyl ether, a bisphenol F epoxy resin, a bisphenol A/F epoxy resin, a modified bisphenol A epoxy resin, a brominated epoxy resin, an epoxy novolac resin, an epoxy phenol novolac resin, an epoxy cresol novolac resin, a difunctional cycloaliphatic epoxy resin, or a glycidyl amine-type multifunctional epoxy resin, or a combination thereof.

20. The method of claim 11, wherein the polymer component comprises at least 20 wt-% of 4-vinyl pyridine-containing polymer based on polymer solids.

21. The method of claim 1, wherein filter media comprising the plurality of fine fibers is forming without increasing the temperature of the plurality of fine fibers above 30°C.

22. The method of claim 11, wherein the filter media comprising the coated fiber is forming without increasing the temperature of the plurality of fine fibers above 30°C.