

CLAIMS

What is claimed is:

1. A method comprising:
generating a polymer solution using a polymerization process, the polymerization process including:
preparing a solvent including at least N-formylmorpholine (NFM) or a combination of NFM with 3-methoxy N,N-dimethylpropanamide (MDP) as a cosolvent,
mixing methylene diphenyl diisocyanate (MDI) and trimellitic anhydride (TMA) with the solvent to generate the polymer solution, and
diluting the polymer solution by adding an NFM:MDP solvent mixture or MDP into the generated polymer solution; and
processing the diluted polymer solution to generate a polyamideimide polymer or a polyamide-amic acid resin polymer.
2. The method of claim 1, wherein the polymer solution is further combined with amine and water to produce a polyamic acid salt form of the polyamide-amic acid resin polymer.
3. The method of claim 1, wherein the prepared solvent includes one or more additional co-solvents selected from cyclohexanone, propylene carbonate, methylethyl ketone, or 2-octanone.
4. The method of claim 1, wherein the polymer solution further includes one or more lubricants, viscosity modifiers, colorant thickening agents, fillers, thinning solvents, thixotropic agents, binders, pigments, fillers, dispersants, surface tension modifiers, stabilizers and fluoropolymers.
5. The method of claim 1, wherein processing the diluted polymer solution includes:
adding the diluted polymer solution to one or more antisolvents to precipitate the resin solids in the solution; and
separating the precipitated resin solids from the solution.
6. The method of claim 1, wherein the polymer solution is diluted for a coating operation, and wherein processing the diluted polymer solution includes:
coating the diluted polymer solution onto a substrate surface to generate a coating; and
curing the coating.
7. A coating composition including a polyamideimide polymer or a polyamide amic acid resin polymer manufactured according to a process including:
preparing a solvent including N-formylmorpholine (NFM) or a combination of NFM and 3-methoxy N,N-dimethylpropanamide (MDP) as a co-solvent;
mixing methylene diphenyl diisocyanate (MDI) and trimellitic anhydride (TMA) with the solvent to generate the polymer solution;

diluting the polymer solution by adding an NFM:MDP solvent mixture or MDP into the generated polymer solution; and

processing the diluted polymer solution to generate a polyamideimide polymer or a polyamide-amic acid resin polymer in a coating solution.

8. The coating composition of claim 7, wherein the coating composition may be implemented to generate a coating by:

coating the diluted polymer solution onto a substrate surface to generate the coating; and curing the coating.

9. The coating composition of claim 7, wherein the polymer solution is further combined with amine and water to produce a polyamic acid salt form of the polyamide-amic acid resin polymer.

10. The coating composition of claim 7, wherein the prepared solvent includes one or more additional co-solvents selected from cyclohexanone, propylene carbonate, methylethyl ketone, or 2-octanone.

11. The coating composition of claim 7, wherein the polymer solution further includes one or more lubricants, viscosity modifiers, colorant thickening agents, fillers, thinning solvents, thixotropic agents, binders, pigments, fillers, dispersants, surface tension modifiers, stabilizers and fluoropolymers.

12. A polyamideimide polymer or a polyamide amic acid resin polymer manufactured according to a process including:

preparing a solvent including N-formylmorpholine (NFM) or a combination of NFM and 3-methoxy N,N-dimethylpropanamide (MDP) as a co-solvent;

mixing methylene diphenyl diisocyanate (MDI) and trimellitic anhydride (TMA) with the solvent to generate the polymer solution;

diluting the polymer solution by adding an NFM:MDP solvent mixture or MDP into the generated polymer solution; and

processing the diluted polymer solution to generate a polyamideimide polymer or a polyamide-amic acid resin polymer, including:

adding the diluted polymer solution to one or more antisolvents to precipitate the resin solids in the solution; and

separating the precipitated resin solids from the solution.

13. The polymer of claim 12, wherein the polymer solution is further combined with amine and water to produce a polyamic acid salt form of the polyamide-amic acid resin polymer.

14. The polymer of claim 12, wherein the prepared solvent includes one or more additional co-solvents selected from cyclohexanone, propylene carbonate, methylethyl ketone, or 2-octanone.
15. The polymer of claim 12, wherein the polymer solution further includes one or more lubricants, viscosity modifiers, colorant thickening agents, fillers, thinning solvents, thixotropic agents, binders, pigments, fillers, dispersants, surface tension modifiers, stabilizers and fluoropolymers.