

CLAIMS

We claim:

1. A method for making a plasticized polymer comprising the step of:
polymerizing a polymerizable monomer in a plasticizer and in the presence of a
5 catalyst system for a time and temperature sufficient to form the plasticized polymer.
2. The method of claim 1, wherein the polymerizing step is a batch process.
3. The method of claim 1, wherein the polymerizing step is a continuous process.
4. The method of claim 1, wherein the molecular weight of the polymer is between about
5,000 to about 200,000 g/mol, preferably between about 7,500 g/mol to about 150,000
10 g/mol, more preferably between about 10,000 g/mol to about 100,000 g/mol, and most
preferably between about 10,000 g/mol to about 80,000 g/mol.
5. The method of claim 1, wherein the amount of monomer added is sufficient to provide an
amount of polymer in the plasticized polymer of from about 2 wt% to an amount just
below the solubilization limit of the plasticized polymer at 230°C.
- 15 6. The method of claim 1, wherein the monomer comprises an unsaturated monomer.
7. The method of claim 6, wherein the unsaturated monomer comprises an alkene.
8. A method for making an adhesive comprising the steps of:
polymerizing a polymerizable monomer in a plasticizer and in the
presence of a catalyst system for a time and temperature sufficient to form
20 the plasticized polymer; and
mixing a tackifying resin with the plasticized polymer to produce the
adhesive.
9. The method of claim 8 further comprising mixing additives with the plasticized polymer.
10. The method of claim 8 further comprising mixing a polymer in solid form polymer with
25 the plasticized polymer.
11. The method of claim 8 further comprising a second polymerizing step different from the
polymerizing step to provide a second plasticized polymer and the mixing step comprises

mixing the second plasticized polymer with the first plasticized polymer to form a bi-modal polymer blend.

12. The method of claim 8 further comprising mixing additional plasticizer with the plasticized polymer, wherein the additional plasticizer is the same as or different from the plasticizer of the plasticized polymer.
13. The method of claim 8 further comprising transporting the plasticized polymer between the polymerizing and mixing steps.
14. The method of claim 8, wherein the polymerizing and mixing steps are carried out without any intervening solvent removal step.
15. The method of claim 8, wherein the polymerizing and mixing steps are carried out without any intervening pelletizing or extruding steps.
16. A composition comprising:
 - (a) a polymer system comprising a first polymer;
 - (b) a plasticized system comprising a first plasticizer that was used in the polymerization step to make the first polymer; and
 - (c) a tackifier.
17. The composition of claim 16 further comprising at least one of a stabilizer and an antioxidant.
18. The composition of claim 16, wherein the first polymer has a density below 0.94 g/ml, preferably below 0.92 g/ml, more preferably below 0.91 g/ml, and most preferable 0.90 g/ml.
19. The composition of claim 18, wherein the number average molecular weight of the first polymer is less than 200,000 g/mol, preferably less than 150,000 g/mol, more preferably less than 100,000 g/mol, and most preferably less than 80,000 g/mol.
20. The composition of claim 16, wherein the polymer system further comprises a second polymer.
21. The composition of claim 17, comprising:
 - (a) between about 10 to about 40 wt% of the polymer system, preferably between

about 15 to about 35 wt% and more preferably between about 20 to about 30 wt%;

(b) between about 10 to about 40 wt% of the plasticizer system, preferably between about 15 to about 35 wt% and more preferably between about 20 to about 30 wt%; and

5 (c) between about 30 to about 70 wt% a tackifier, preferably between about 35 to about 65 wt% and more preferably between about 40 to about 60 wt%.

22. The composition of claim 16, wherein the plasticizer system comprises at least about 25 wt% of the first plasticizer, preferably at least about 50 wt% of the first plasticizer, more preferably at least about 75 wt% of the first plasticizer, and most preferably at least about
10 90 wt% of the first plasticizer.

23. The composition of claim 16, wherein the composition is one of an adhesive, a sealant, a coating, or a lubricant.