

CLAIMS

1. A thioacetate isobutylene-based polymer composition comprising
 - (a) a thioalkylated functionalized polymer; and
 - (b) one of or a combination of any of the following:
 - 5 (i) a sulfur donor;
 - (ii) a blend of sulfur and a sulfur donor; and
 - (iii) an accelerator cure system.
2. The thioacetate isobutylene-based polymer composition of claim 1, wherein the
10 functionalized polymer is thioacetate functionalized poly(isobutylene-co-para-methylstyrene).
3. The thioacetate isobutylene-based polymer composition of any preceding claim, further comprising at least one filler.
- 15 4. The thioacetate isobutylene-based polymer composition of any preceding claim, wherein the sulfur donor is selected from the group consisting of tetramethyl thiuram disulfide (“TMTD”), 4,4'-dithiodimorpholine, dipentamethylene thiuram tetrasulfide (“DPTT”), and thiocarbamyl sulfonamide.
- 20 5. The thioacetate isobutylene-based polymer composition of any preceding claim, wherein the accelerator cure system comprises one or more of thiazoles, amines, guanidines, sulfenamides, thiurams, dithiocarbamates, and/or zanthates.
6. The thioacetate isobutylene-based polymer composition of claim 5, wherein the
25 accelerator cure system is N-cyclohexyl-2-benzothiazole sulfenamide (“CBS”) or diphenylguanidine (“DPG”).
7. The thioacetate isobutylene-based polymer composition of claim 3, wherein the filler
is selected from the group consisting of carbon black, white filler, and combinations thereof.
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8. The thioacetate isobutylene-based polymer of any preceding claim, wherein the composition is useful as a thermoset in pharmaceutical and tire applications.

9. A thermoset composition comprising:
(a) a thioalkylated functionalized polymer; and
(b) one of or a combination of any of the following:
 (i) a sulfur donor;
 (ii) a blend of sulfur and a sulfur donor; and
 (iii) an accelerator cure system;
wherein the composition is substantially free of zinc.
10. The thermoset composition of claim 9, wherein the functionalized polymer is thioacetate functionalized poly(isobutylene-co-para-methylstyrene).
11. The thermoset composition of claims 9-10, further comprising at least one filler.
12. The thermoset composition of claim 11, wherein the filler is selected from the group of carbon black, white filler, and combinations thereof.
13. The thermoset composition of claims 9-12, wherein the accelerator cure system is N-cyclohexyl-2-benzothiazole sulfenamide ("CBS") or diphenylguanidine ("DPG").
14. The thermoset composition of claims 9-13, wherein the sulfur donor is selected from the group consisting of tetramethyl thiuram disulfide ("TMTD"), 4,4'-dithiodimorpholine, dipentamethylene thiuram tetrasulfide ("DPTT"), and thiocarbamyl sulfonamide.
15. A rubber composition comprising the thermoset composition of any preceding claim.
16. The rubber composition of claim 15 further comprising a hydrocarbon resin.
17. The rubber composition of claim 16, wherein the hydrocarbon resin is hydrogenated.
18. The rubber composition of claims 15-17, wherein the hydrocarbon resin comprises cyclopentadiene, dicyclopentadiene, methylcyclopentadiene, and combinations thereof.
19. An article comprising the rubber composition of claims 15-18.