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:

(i) a sulfur donor;

(ii) a blend of sulfur and a sulfur donor; and

(iii) an accelerator cure system

wherein the functionalized polymer is thioacetate functionalized poly(isobutylene-co-para-methylstyrene).

2. 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.

3. 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.

4. The thioacetate isobutylene-based polymer composition of claim 3, wherein the accelerator cure system is N-cyclohexyl-2-benzothiazole sulfenamide ("CBS") or diphenylguanidine ("DPG").

5. 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 functionalized polymer is thioacetate functionalized poly(isobutylene-co-para-methylstyrene) and the composition is substantially free of zinc.

6. The thermoset composition of claim 5, wherein the accelerator cure system is N-cyclohexyl-2-benzothiazole sulfenamide ("CBS") or diphenylguanidine ("DPG").

7. The thermoset composition of claims 5-6, 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.

8. A rubber composition comprising the thermoset composition of claim 5, further comprising a hydrocarbon resin.