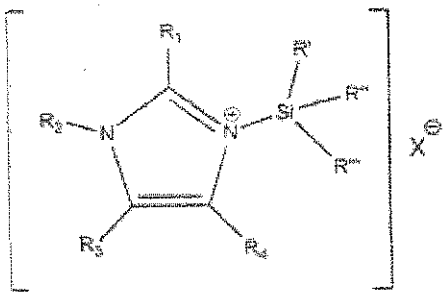
What is claimed is:

1. Use of a~~A~~ silylimidazolium salt complex represented by the following Formula I:



Formula I

wherein

R_1-R_4 are substituents of the imidazole ring and R_1-R_4 each independently represents a hydrogen atom, a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group ~~an organic group~~ that forms a stable imidazole ring within the silylimidazolium salt complex;

R', R" and R"' are substituents of the silyl functional group and R', R", and R"' each independently represents a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group ~~an organic group~~ that forms a stable silyl function group within the silylimidazolium salt complex; and

X^- is an anion which forms a stable salt complex with the silylimidazolium cation within the silyimidazolium salt complex wherein the anion X^- comprises a halide, R-SO_3^-, PF_6^-, or BR_4^- and wherein R represents a halide, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryl group, or CF_3^-,

as a latent catalyst for curing an epoxy resin.

~~2. The silylimidazolium salt complex according to claim 1, wherein the anion X^- comprises a halide, R-SO_3^-, PF_6^-, or BR_4^-; and wherein R represents a halide, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryl group, or CF_3^-.~~

~~3. The silylimidazolium salt complex according to claim 1, wherein the substituents R_1-R_4 each independently represents a hydrogen atom, a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group.~~

~~4. The silylimidazolium salt complex according to claim 1, wherein the substituents R', R" and R"' each independently represents a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group.~~

5. A catalyst comprising the silylimidazolium salt complex of claim 1.

6. A tunable latent catalyst comprising at least one silylimidazolium salt complex, wherein the silylimidazolium salt complex comprises an imidazole ring with a silyl functional group attached to one of the nitrogen atoms in the imidazole ring.

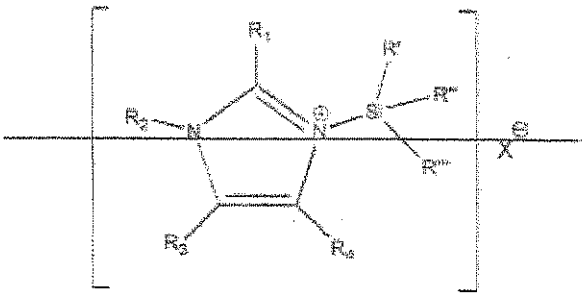
7. The catalyst according to claim 6, wherein the silylimidazolium salt complex is represented by the following Formula I: wherein

R_1-R_4 are substituents of the imidazole ring and R_1-R_4 each independently represents an organic group that forms a stable imidazole ring within the silylimidazolium salt complex;

R', R" and R"' are substituents of the silyl functional group and R', R", and R"' each independently represents an organic group that forms a stable silyl function group within the silylimidazolium salt complex; and

X^- is an anion which forms a stable salt complex with the silylimidazolium cation within the silyimidazolium salt complex.

8. The catalyst according to claim 7, wherein the anion X^- comprises a halide, $R\text{-}SO_3^-$, PF_6^-, or BR_4^-, and wherein R represents a halide, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryl group, or CF_3^-.



Formula I

~~9. The catalyst according to claim 7, wherein the substituents R_1-R_4 each independently represents a hydrogen atom, a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group.~~

~~10. The catalyst according to claim 7, wherein the substituents R', R'' and R''' each independently represents a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group.~~

~~11. The catalyst according to claim 7, wherein the silylimidazolium salt complex has an active temperature and wherein the active temperature is tunable by changing identities of the anion X¯ in the silylimidazolium salt complex.~~

~~12. The catalyst according to claim 7, wherein the silylimidazolium salt complex has an active temperature and wherein the active temperature is tunable by changing identities of the substituents R_1-R_4 of the imidazole ring in the silylimidazolium salt complex.~~

~~13. The catalyst according to claim 7, wherein the silylimidazolium salt complex has an active temperature and wherein the active temperature is tunable by changing identities of the substituents R', R'', and R''' of the silyl functional group in the silylimidazolium salt complex.~~

~~14~~2. The catalyst according to claim 1~~6~~, wherein the catalyst is inert at room temperature and active at a temperature greater than ~~about~~ 120°C.

~~15~~3. The use ~~catalyst~~ according to claim ~~14~~2, wherein the active temperature of the catalyst is from ~~about~~ 120°C to ~~about~~ 230°C.

~~16~~4. The use ~~catalyst~~ according to claim ~~15~~3, wherein the active temperature of the catalyst is from ~~about~~ 150°C to ~~about~~ 230°C.

~~17~~5. The use ~~catalyst~~ according to claim ~~16~~4, wherein the active temperature of the catalyst is from ~~about~~ 180°C to ~~about~~ 220°C.

~~18~~6. A thermosettable epoxy resin composition comprising a) an epoxy resin, b) a curing agent, and c) a catalyst; wherein the catalyst comprises the silylimidazolium salt complex as defined in any one of claims 1 to 5.

~~19~~7. The composition according to claim ~~6~~18, wherein the catalyst is present in an amount of ~~about~~ 0.1 to ~~about~~ 10 moles percent based on the total mole percent of the epoxy resin present in the composition.

~~20~~8. The composition according to claim ~~7~~19, wherein the catalyst is present in an amount of ~~about~~ 0.1 to ~~about~~ 5 moles percent based on the total mole percent of the epoxy resin present in the composition.

~~21~~9. The composition according to claim ~~8~~20, wherein the catalyst is present in an amount of ~~about~~ 0.1 to ~~about~~ 1 mole percent based on the total mole percent of the epoxy resin present in the composition.

~~22. A thermosettable epoxy resin composition comprising a) an epoxy resin, b) a curing agent, and c) the tunable latent catalyst of claim 6.~~

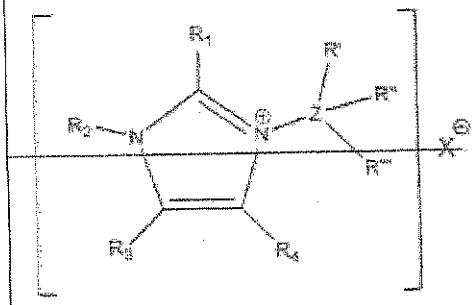
~~10~~23. An article comprising an epoxy resin obtainable by using the thermosettable epoxy resin composition according to claim ~~18~~6.

~~24. An article comprising the thermosettable epoxy resin composition according to claim 22.~~

~~11~~25. The article according to claim ~~10~~22 ~~or claim 24~~, wherein the article is at least one of a coating, an electrical or structural laminate, an electrical or structural composite, a filament winding, a molding, a casting, or an encapsulation.

~~12~~26. The article according to claim ~~11~~25, wherein the article is a powder coating.

~~27. An imidazolium salt complex represented by the following Formula II:~~



~~Formula II~~

wherein

Z is a stannyl, phosphinoyl, or a sulfonyl functional group;

R_1-R_4 are substituents of the imidazole ring and R_1-R_4 each independently represents an organic group that forms a stable imidazole ring within the imidazolium salt complex;

R', R" and R"' are substituents of the silyl functional group and R', R", and R"' each independently represents an organic group that forms a stable {-ZR'R"R"'} functional group within the imidazolium salt complex; and

X^- is an anion which forms a stable salt complex with the imidazolium cation within the imidazolium salt complex.

28. The imidazolium salt complex according to claim 27, wherein the anion X^- comprises a halide, R-SO_3^-, PF_6^-, or BR_4^-, and wherein R represents a halide, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryl group, or CF_3^-.

29. The imidazolium salt complex according to claim 27, wherein the substituents R_1-R_4 each independently represents a hydrogen atom, a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group.

30. The imidazolium salt complex according to claim 27, wherein the substituents R', R" and R"' each independently represents a substituted or unsubstituted alkyl, a substituted or unsubstituted alkoxy, or a substituted or unsubstituted aryl group.

31. A catalyst comprising the imidazolium salt complex of claim 27.