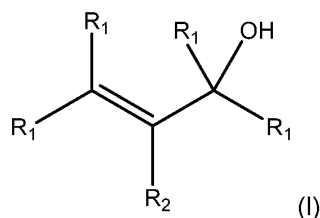
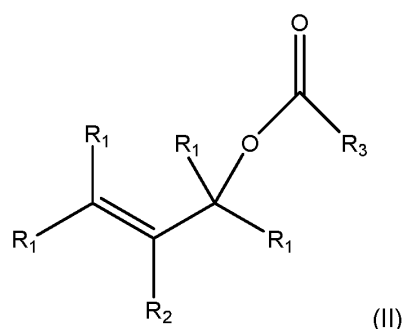


Claims

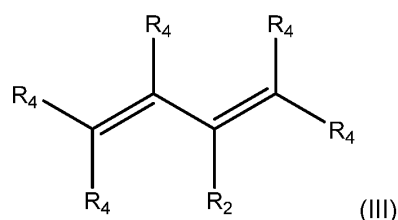
1. A method for the *in-situ* formation of a conjugated diene of formula (III) from an allyl alcohol of formula (I), the method comprising conversion of the allyl alcohol of formula (I)



to an allyl carbonate, allyl ester or allyl formate of formula (II)



in the presence of a base followed by conversion of the allyl carbonate, allyl ester or allyl formate of formula (II) to the conjugated diene of formula (III)



using a palladium catalyst or catalyst precursor and an organic phosphorous ligand, wherein

each R₁ is independently selected from H, alkyl, substituted alkyl, alkenyl, substituted alkenyl, aromatic hydrocarbon, and substituted aromatic hydrocarbon;

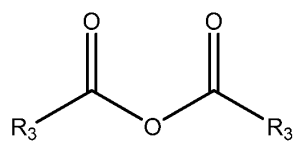
R₂ is selected from H, alkyl, substituted alkyl, alkenyl, substituted alkenyl, aromatic hydrocarbon, and substituted aromatic hydrocarbon;

R₃ is selected from H, alkyl, substituted alkyl, alkoxy, substituted alkoxy, phenyl and substituted phenyl;

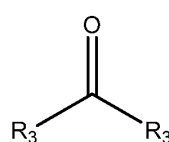
each R₄ is independently selected from H, alkyl, substituted alkyl, alkenyl, substituted alkenyl, aromatic hydrocarbon, and substituted aromatic hydrocarbon; and

wherein at least one R₁ bears a proton in α-position of the allylic C3 group which is deprotonated under basic reaction conditions thus forming a diene of formula (III) via

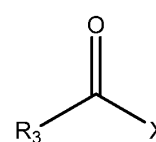
- 1,2 or 1,4 elimination and the at least one R_1 is alkyl, substituted alkyl, alkenyl, substituted alkenyl, aromatic hydrocarbon, or substituted aromatic hydrocarbon.
2. The method of claim 1, wherein each R_1 is independently selected from H, alkyl and alkenyl; R_2 is selected from H, alkyl and alkenyl; R_3 is selected from H, alkyl and alkoxy; and each R_4 is independently selected from H, alkyl and alkenyl.
 3. The method of claim 1 or 2, wherein the total number of carbon atoms in the compound of formula (I) is from 6 to 40, and/or the total number of carbon atoms in R_3 is from 1 to 4.
 4. The method of any preceding claim, wherein the compound of formula (I) is selected from 2,7-octadiene-1-ol, nerolidol, homolinalool, ethyl linalool, 2,6-dimethyloct-2-ene-1,8-diol, 3,7-dimethyloct-5-ene-1,7-diol, 3,7-dimethyloct-7-ene-1,6-diol, 2,4,8-trimethylnona-2,7-dien-4-ol, methylgeraniol, 3,5-dimethylhex-2-en-1-ol, 6,10-dimethylundeca-1,5,9-trien-4-ol, 6,10-dimethylundeca-5,9-dien-1-yn-4-ol, and 1-(3-hydroxy-3-methylpent-4-en-1-yl)-2,5,5,8a-tetramethyldecahydronaphthalen-2-ol.
 5. A method of any preceding claim, wherein the conversion of the allyl alcohol of formula (I) to the allyl carbonate, allyl ester or allyl formate of formula (II) in the presence of a base takes place by reacting the allyl alcohol of formula (I) with a compound of formula (IV), a compound of formula (V), or a compound of formula (VI)



(IV)



(V)



(VI)

wherein X is Cl or Br; and

R_3 is as defined in any one of the preceding claims.

6. The method of claim 5, wherein the compound of formula (IV) is acetic anhydride or the compound of formula (V) is dimethyl carbonate.
7. The method of any preceding claim, wherein the base is selected from triethylamine, tributylamine, dimethylaminopyridine, sodium methoxide, or combinations thereof.
8. The method of any preceding claim, wherein the palladium catalyst precursor is $\text{Pd}(\text{OAc})_2$.

9. The method of any preceding claim, wherein the organic phosphorous ligand is an organic phosphine ligand, for example an organic bisphosphine ligand.
10. The method of any preceding claim, wherein the organic phosphorous ligand is selected from (oxydi-2,1-phenylene)bis(diphenylphosphine), 1,5-pentanediyldis[diphenylphosphine], and 1,1'-Bis(diphenylphosphino)ferrocene.
11. The method of any preceding claim, wherein the yield of the conjugated diene of formula (III) is equal to or greater than about 45 %, and/or wherein the purity of the conjugated diene of formula (III) is equal to or greater than about 75 %.
12. The method of any preceding claim, wherein the compound of formula (III) is selected from farnesene, 6-*E*-farnesene, ethyl myrcene, 5-methyl-3-methylenhex-1-ene, octa-1,3,7-triene, homomyrcene, *E*-homomyrcene, 2,8-dimethyl-4-methylenonona-2,7-diene, (*E*)-3,7-dimethylocta-5,7-dien-1-yl acetate, (*E*)-10-methyl-6-methyleneundeca-1,4,9-triene, and (*E*)-10-methyl-6-methyleneundeca-4,9-dien-1-yne.