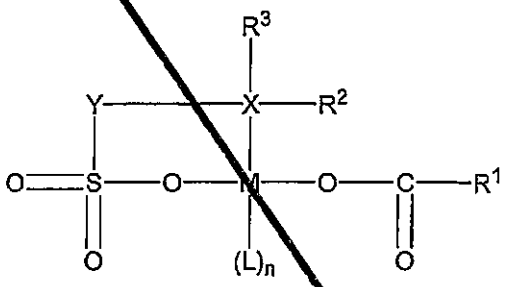
CLAIMS

[1] A carboxylate metal complex represented by formula (C1)

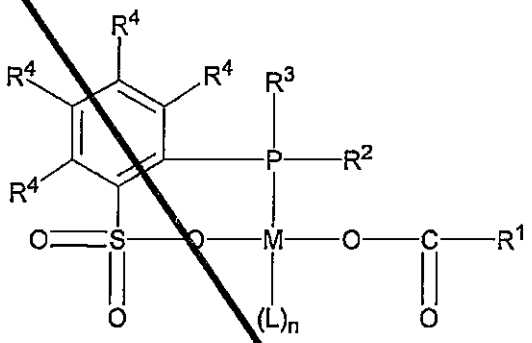


(C1)

(in the formula, M represents a metal atom of group 10 element in the periodic table; X represents a phosphorous atom (P) or an arsenic atom (As); R^1 represents a hydrogen atom or hydrocarbon group having 1 to 30 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group and amino group; R^2 and R^3 independently represent a hydrogen atom, alkoxy group, aryloxy group, acyloxy group, silyl group, amino group or hydrocarbon group having 1 to 30 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group and amino group; R^2 and R^3 may bond to each other to form a ring structure; Y represents divalent hydrocarbon group having 1 to 70 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group and amino group; L represents a neutral electron-donating ligand and n is 0, 1/2, 1 or 2.

2. The carboxylate metal complex as claimed in claim 1, wherein the carboxylate metal complex represented by formula

(C1) is represented by formula (C2)



(C2)

(in the formula, four R^4s independently represent a hydrogen atom, alkyl group having 1 to 8 carbon atoms, alkoxy group having 1 to 8 carbon atoms, aryloxy group having 6 to 18 carbon atoms or a halogen atom; and M, R^1, R^2, R^3, L and n have the same meanings as in claim 1).

3. The carboxylate metal complex as claimed in claim 2, wherein M in formula (C2) is Ni or Pd.

4. The carboxylate metal complex as claimed in claim 2 or 3, wherein R^1 in formula (C2) is hydrocarbon group having 1 to 30 carbon atoms which may be substituted by a halogen atom.

5. The carboxylate metal complex as claimed in claim 4, wherein R^1 in formula (C2) is methyl group or trifluoromethyl group.

6. The carboxylate metal complex as claimed in claim 5, wherein R^1 in formula (C2) is methyl group.

7. The carboxylate metal complex as claimed in any one of claims 2 to 6, wherein both of R^2 and R^3 in formula (C2) are

isopropyl group or cyclohexyl group.

8. The carboxylate metal complex as claimed in any one of claims 2 to 7, wherein all of R^4s in formula (C2) are a hydrogen atom.

9. The carboxylate metal complex as claimed in any one of claims 2 to 8, wherein L in formula (C2) is 2,6-dimethylpyridine and n is 1.

10. A catalyst for olefin polymerization mainly comprising the carboxylate metal complex claimed in any one of claims 1 to 9.

11. A method for producing a polymer characterized in polymerizing olefin represented by formula (1) singly or in combination of two or more kinds thereof, or copolymerizing olefin represented by formula (1) and polar group-containing olefin represented by formula (2)

$CH_2=CHR^5$ (1)

(In the formula, R^5 represents a hydrogen atom or hydrocarbon group having 1 to 20 carbon atoms)

$CH_2=CR^6R^7$ (2)

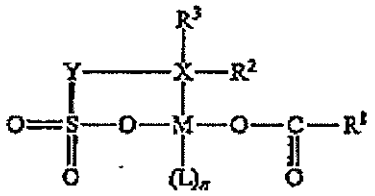
(In the formula, R^6 represents a hydrogen atom or methyl group, R^7 represents $-COOR^8$, $-CN$, $-OCOR^8$, $-CH_2-OCOR^8$, $-CH_2OH$, $-CH_2-N(R^9)_2$ or $-CH_2-Hal$ (R^8 represents a hydrogen atom or hydrocarbon group having 1 to 5 carbon atoms, R^9 represents a hydrogen atom, hydrocarbon group having 1 to 5 carbon atoms or aromatic substituent having 6 to 18 carbon atoms or alkoxycarbonyl group, and Hal represents a halogen atom).

CLAIMS

The invention claimed is:

1. A carboxylate metal complex represented by formula (C1);

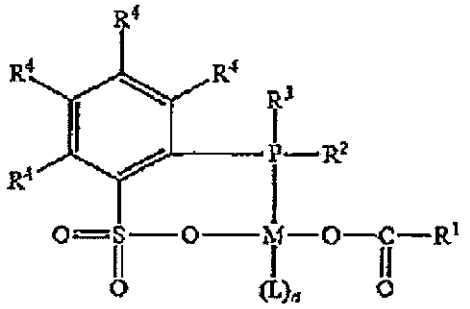
(C1)



(in the formula, M represents a metal atom of group 10 element in the periodic table; X represents a phosphorous atom (P) or an arsenic atom (As); R^1 represents a hydrogen atom or hydrocarbon group having 1 to 30 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group or amino group; R^2 and R^3 independently represent a hydrogen atom, alkoxy group, aryloxy group, acyloxy group, silyl group, amino group or hydrocarbon group having 1 to 30 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group or amino group; R^2 and R^3 may bond to each other to form a ring structure; Y represents divalent hydrocarbon group having 1 to 70 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group or amino group; L represents a neutral electron-donating ligand and n is 0, ½, 1 or 2.

2. The carboxylate metal complex as claimed in claim 1, wherein the carboxylate metal complex represented by formula (C1) is represented by formula (C2);

(C2)



(in the formula, four R^4s independently represent a hydrogen atom, alkyl group having 1 to 8 carbon atoms, alkoxy group having 1 to 8 carbon atoms, aryloxy group having 6 to 18 carbon atoms or a halogen atom; and M, R^1, R^2, R^3, L and n have the same meanings as in claim 1.

3. The carboxylate metal complex as claimed in claim 2, wherein M in formula (C2) is Ni or Pd.

4. The carboxylate metal complex as claimed in claim 2, wherein R^1 in formula (C2) is hydrocarbon group having 1 to 30 carbon atoms which may be substituted by a halogen atom.

5. The carboxylate metal complex as claimed in claim 4, wherein R^1 in formula (C2) is methyl group or trifluoromethyl group.

6. The carboxylate metal complex as claimed in claim 5, wherein R^1 in formula (C2) is methyl group.

7. The carboxylate metal complex as claimed in claim 2, wherein both of R^2 and R^3 in formula (C2) are isopropyl group or cyclohexyl group.

8. The carboxylate metal complex as claimed in claim 2, wherein all of R^4s in formula (C2) are a hydrogen atom.

9. The carboxylate metal complex as claimed in claim 2, wherein L in formula (C2) is 2,6-dimethylpyridine and n is 1.

10. A catalyst for olefin polymerization mainly comprising the carboxylate metal complex claimed in claim 1.

11. A method for producing a polymer which comprises polymerizing an olefin represented by formula (1) singularly or in combination of two or more kinds thereof, or copolymerizing an olefin represented by formula (1) and polar group-containing olefin represented by formula (2);

$$CH_2=CHR^5 \quad (1)$$

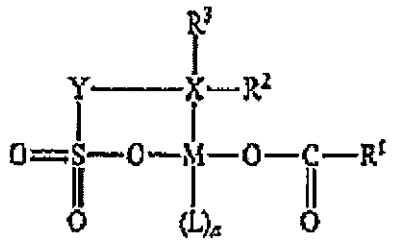
in the formula, R^5 represents a hydrogen atom or hydrocarbon group having 1 to 20 carbon atoms;

$$CH_2=CR^6R^7 \quad (2)$$

in the formula, R^6 represents a hydrogen atom or methyl group, R^7 represents $-COOR^8$, $-CN$, $-OCOR^8$, $-CH_2-OCOR^8$, $-CH_2OH$, $-CH_2-N(R^9)_2$ or $-CH_2$-Hal, R^8 represents a hydrogen atom or hydrocarbon group having 1 to 5 carbon atoms, R^9 represents a hydrogen atom, hydrocarbon group having 1 to 5 carbon atoms or aromatic substituent having 6 to 18 carbon atoms or alkoxycarbonyl group, and Hal represents a halogen atom,

wherein the polymerization reaction is carried out in the presence of a carboxylate metal complex represented by the formula (C1);

(C1)



in the formula, M represents a metal atom of group 10 element in the periodic table; X represents a phosphorous atom (P) or an arsenic atom (As); R^1 represents a hydrogen atom or hydrocarbon group having 1 to 30 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group or amino group; R^2 and R^3 independently represent a hydrogen atom, alkoxy group, aryloxy group, acyloxy group, silyl group, amino group or hydrocarbon group having 1 to 30 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group or amino group; R^2 and R^3 may bond to each other to form a ring structure; Y represents divalent hydrocarbon group having 1 to 70 carbon atoms which may be substituted by one or more functional groups selected from a halogen atom, alkoxy group, aryloxy group, acyloxy group or amino group; L represents a neutral electron-donating ligand and n is 0, ½, 1 or 2.