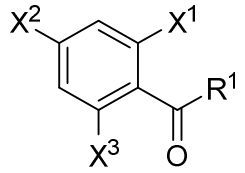
Summary of the disclosure

In one aspect, there is provided a process for the preparation of a compound of formula (II)



(II)

wherein

X^1 is selected from F, CH_2F, CHF_2, and CF_3,

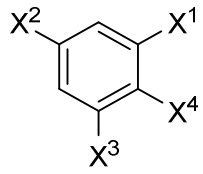
X^2 is H, F, Cl, or NO_2,

X^3 is selected from H, F, CH_3, CH_2F, CHF_2, and CF_3, and

R^1 is selected from linear or branched C_{1-12} alkyl, linear or branched C_{1-12} fluoroalkyl, C_{3-8} cycloalkyl, linear or branched C_{2-12} hydroxyalkyl, linear or branched C_{1-12} carboxyalkly, phenyl and optionally substituted carboxy phenyl;

the process comprising

(i) reacting a compound of formula (III)



(III)

wherein X^4 is Br or Cl

with

a compound of formula (IV) R^2-Mg-Hal (IV) or Mg, and

a compound of formula (V) R^{1a}-C(=O)OC(=O)-R^{1a} (V), a cyclic anhydride or a lactone,

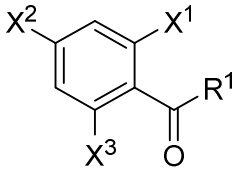
wherein

R^{1a} is selected from linear or branched C_{1-12} alkyl, linear or branched C_{1-12} fluoroalkyl, C_{3-8} cycloalkyl, and phenyl,

Hal is halogen, and

R^2 is selected from a linear or branched C_{1-6} alkyl, C_{3-6} cycloalkyl, and phenyl.

In one example, the present disclosure provides a process for the preparation of a compound of formula (II)



(II)

wherein

X^1 is selected from H, F, CH_3, CH_2F, CHF_2, and CF_3,

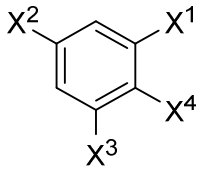
X^2 is H, F, Cl, or NO_2,

X^3 is selected from H, F, CH_3, CH_2F, CHF_2, and CF_3, and

R^1 is selected from linear or branched C_{1-12} alkyl, linear or branched C_{1-12} fluoroalkyl, C_{3-8} cycloalkyl, linear or branched C_{2-12} hydroxyalkyl, linear or branched C_{1-12} carboxyalkly, phenyl and optionally substituted carboxy phenyl;

the process comprising

(i) reacting a compound of formula (III)



(III)

wherein X^4 is Br or Cl

with

a compound of formula (IV) R^2-Mg-Hal (IV) or Mg, and

a compound of formula (V) R^{1a}-C(=O)OC(=O)-R^{1a} (V), a cyclic anhydride or a lactone,

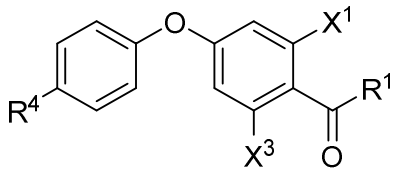
wherein

R^{1a} is selected from linear or branched C_{1-12} alkyl, linear or branched C_{1-12} fluoroalkyl, C_{3-8} cycloalkyl, and phenyl,

Hal is halogen, and

R^2 is selected from a linear or branched C_{1-6} alkyl, C_{3-6} cycloalkyl, and phenyl.

In another aspect, there is provided a process for the preparation of a compound of formula (I)



(I)

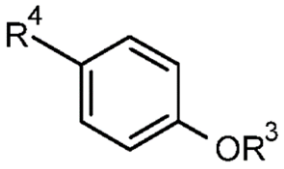
wherein R^1, X^1 and X^3 are defined as above, and

R^4 is halogen;

the process comprising

(i) the process as described above to obtain a compound of formula (II) as defined above with the proviso that in the compound of formula (II) X^2 is F, Cl, or NO_2, and

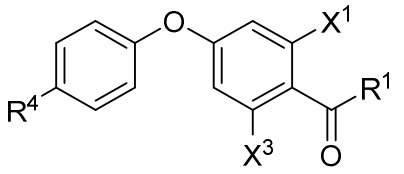
(ii) reacting the compound of formula (II) obtained in step (i) with a compound of formula (VI)



(VI)

wherein R^3 is hydrogen or an alkali metal cation.

In a further example, the present disclosure provides a process for the preparation of a compound of formula (I)



(I)

wherein

X^1 is selected from H, F, CH_3, CH_2F, CHF_2, and CF_3,

X^3 is selected from H, F, CH_3, CH_2F, CHF_2, and CF_3,

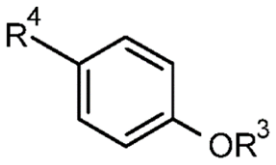
R^1 is selected from linear or branched C_{1-12} alkyl, C_{1-12} fluoroalkyl, C_{3-8} cycloalkyl, linear or branched C_{2-12} hydroxyalkyl, linear or branched C_{1-12} carboxyalkly, phenyl and optionally substituted carboxy phenyl, and

R^4 is halogen;

the process comprising

(i) the process according to the present disclosure for obtaining a compound of formula (II) as defined herein with the proviso that in the compound of formula (II) X^2 is F, Cl, or NO_2, and

(ii) reacting the compound of formula (II) obtained in step (i) with a compound of formula (VI)



(VI)

wherein R^3 is hydrogen or an alkali metal cation.

Detailed description of the invention

In the following, the invention will be explained in more detail.

According to the present invention, the term “linear or branched C_{1-12} alkyl” refers to a straight-chained or branched saturated hydrocarbon group having 1 to 12 carbon atoms, such as 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12 carbon atoms. Likewise, the term “linear or branched C_{1-6} alkyl” refers to a straight-chained or branched saturated hydrocarbon group having 1 to 6 carbon atoms (i.e. 1,, 2, 3, 4, 5, or 6 carbon atoms) including methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl, pentyl, 1-methylbutyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, 1-ethylpropyl, 1,1-dimethylpropyl, 1,2-dimethylpropyl, hexyl, 1-methylpentyl, 2-