provide a method for producing a polycarbonate safely and efficiently even without using a base.

MEANS FOR SOLVING THE PROBLEMS

[0009]

The inventor of the present disclosure repeated intensive studies in order to solve the above-described problems. As a result, the inventor completed the present disclosure by finding that a carbonate derivative can be amazingly produced without using a base in a safe and efficient manner by subjecting a halogenated methane and the specific amount of a hydroxy group-containing compound to a photoreaction in the presence of oxygen. A halogenated hydrocarbon has been conventionally considered not to be decomposed by increasing a ratio of a hydroxy group-containing compound to the halogenated hydrocarbon, since a hydroxy group-containing compound is known as a stabilizer to prevent a halogenated hydrocarbon from being decomposed. On the one hand, it was very surprising that even when a base is not used, a reaction proceeds from a halogenated formate ester and a carbonate derivative is efficiently generated.

The present disclosure is hereinafter described.

[0009a]

In an aspect, there is provided a method for producing a carbonate derivative,

the method comprising the step of irradiating a high energy light comprising UV-C having a wavelength of 180 nm or more and 280 nm or less to a composition comprising a halogenated methane and a hydroxy group-containing compound in the presence of oxygen,

wherein the composition does not contain a base or a catalyst;

CLAIMS

1. A method for producing a carbonate derivative,

the method comprising the step of irradiating a high energy light comprising UV-C having a wavelength of 180 nm or more and 280 nm or less to a composition comprising a halogenated methane and a hydroxy group-containing compound in the presence of oxygen,

wherein the composition does not contain a base or a catalyst;

wherein a molar ratio of a total usage amount of the hydroxy group-containing compound to 1 mole of the halogenated methane is 0.05 or more and 10 or less,

wherein the hydroxy group-containing compound is represented by the following formula (i) and the carbonate derivative is a linear carbonate derivative represented by the following formula (I), or

the hydroxy group-containing compound is represented by the following formula (ii) and the carbonate derivative is a carbonate derivative comprising a unit represented by the following formula (II-1) or a cyclic carbonate derivative represented by the following formula (II-2):

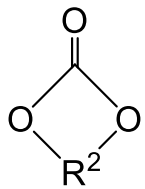
(i) R^1-OH

(ii) HO-R^2-OH

(I) R^1-O-C(=O)-O-R^1

(II-1) [-O-R^2-O-C(=O)-]

(II-2)



wherein

R^1 is a monovalent C_{1-200} organic group optionally comprising a hetero atom,

R^2 is a divalent C_{1-200} organic group optionally comprising a hetero atom.

2. The method according to claim 1, wherein the halogenated methane is chloroform.

3. The method according to claim 1 or 2, further comprising the step of stirring the composition without irradiating the high energy light.

~~4. The method according to any one of claims 1 to 3, wherein the high energy light comprises a light having a wavelength of 180 nm or more and 280 nm or less.~~

~~5~~4. The method according to any one of claims 1 to ~~4~~3, wherein two or more kinds of the hydroxy group-containing compound are used.