

- [54] SENSITIZER FOR USE IN ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL
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- [22] Filed: Oct. 15, 1973
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[52] U.S. Cl. 96/1.5; 252/501; 260/315
 [51] Int. Cl.²..... G03G 5/04; C07D 209/82
 [58] Field of Search 96/1.5; 260/315; 252/501

[56] **References Cited**

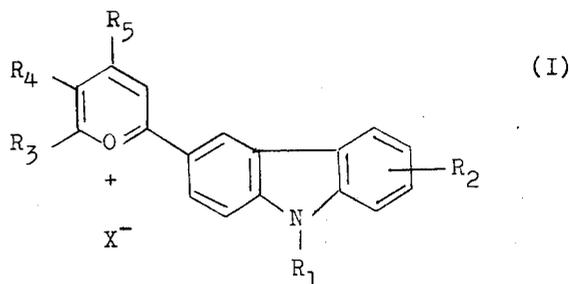
UNITED STATES PATENTS

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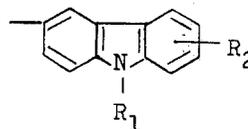
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[57] **ABSTRACT**

A sensitizer for use in an electrophotographic light-sensitive material containing an organic photoconductor comprising a pyrylium salt containing a carbazole nucleus represented by the following general formula (I);



wherein R₁ represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, a haloalkyl group having from 1 to 5 carbon atoms a cyanoalkyl group having from 2 to 6 carbon atoms, a hydroxyalkyl group having 1 to 5 carbon atoms, or an acyl group; R₂ represents a hydrogen atom, a halogen atom or a nitro group, R₃ represents



R₄ represents a hydrogen atom or a hydroxy group; or R₃ and R₄ when taken together form a substituted or unsubstituted benzene or naphthalene ring, said substituents being an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 3 carbon atoms, a nitro group or a halogen atom; R₅ represents a hydrogen atom or



R₆ represents a hydrogen atom, a halogen atom, an amino group, an alkylamino group having from 1 to 4 carbon atoms or an alkyl group having 1 to 5 carbon atoms; X represents Cl⁻, Br⁻, I⁻, ClO₄⁻, NO₃⁻, HSO₄⁻ or BF₄⁻.

7 Claims, No Drawings

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**SENSITIZER FOR USE IN
ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE
MATERIAL**

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a sensitizer for use in an electrophotographic light-sensitive material wherein an organic compound is used as a photoconductor.

2. Description of the Prior Art

In electro photography where an organic photoconductor is used, the element most influencing the light sensitivity is a sensitizer.

As organic photoconductors for use in electro photography, polyvinyl hetero ring compounds represented by poly-N-vinyl carbazole; polynuclear aromatic vinyl polymers such as polyvinylanthracene; low molecular weight compounds having a hetero ring such as an oxazole nucleus, a thiazole nucleus, etc.; and the like, have been used heretofore.

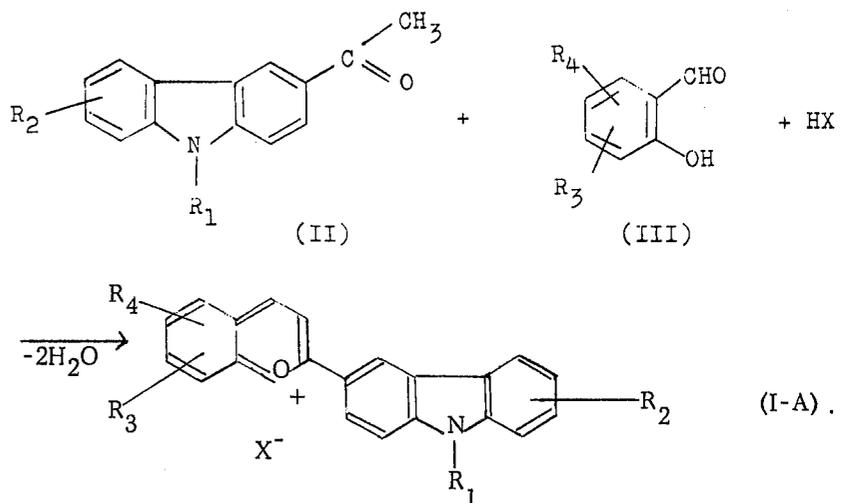
However, these materials do not provide sufficient light sensitivity when used independently.

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synthesis of the various pyrylium salts suitably used in the present invention can be by condensing (A) an o-hydroxyarylaldehyde and a carbonyl compound or (B) one molecule of an arylaldehyde and two molecules of a carbonyl compound, in an inert solvent, such as a substituted aromatic hydrocarbon, e.g., nitrobenzene, chlorobenzene, etc., referenced in the above-described literature as one convenient process for synthesizing pyrylium salts.

That is, the various pyrylium salts can be synthesized by the above-described reaction (A) using an o-hydroxyarylaldehyde represented by the following general formula (III) and a carbonyl group-containing carbazole derivative represented by the following general formula (II), or by the above described reaction (B) using a carbonyl group containing carbazole derivative represented by the following general formula (II) and an arylaldehyde represented by the following general formula (IV). Reactions (A) and (B) are schematically described below:

A. (Reaction between an o-hydroxyarylaldehyde (III) and a carbonyl group containing carbazole derivative (II))



SUMMARY OF THE INVENTION

The present invention provides an absolutely novel sensitizer which, when added to an organic photoconductor, improves not only the light sensitivity but also broadens the wavelength region to which the photoconductor is sensitive. More particularly, the present invention provides a sensitizer comprising a pyrylium salt having a carbazole nucleus.

DETAILED DESCRIPTION OF THE INVENTION

The following various literature reports have been made on the synthesis of pyrylium salts:

a. *Proceeding of the Indian Academy of Science*, Section A, 37A, 544 - 550, (1953); (*Chemical Abstracts*, 48, 11402 (1954))

b. *Proceeding of the Indian Academy of Science*, Section A, 34A, 77 - 87 (1951); (*Chemical Abstracts*, 46, 11189 (1952))

c. *Helvetica Chimica Acta*, 39, 1 - 15 (1956), issued by Verlag Helvetica Chimica Acta; (*Chemical Abstracts*, 50, 6445 (1956)).

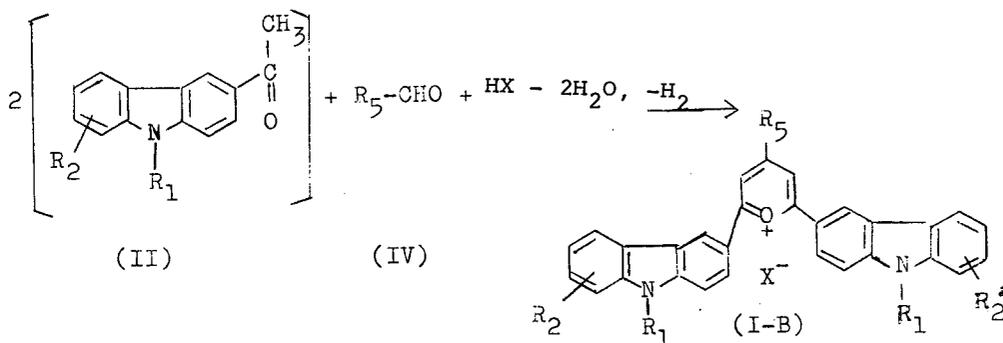
It has been found that, in the present invention, the

wherein R₁ represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms (such as methyl, ethyl, propyl, butyl or pentyl), a haloalkyl group having from 1 to 5 carbon atoms (such as chloromethyl, chloroethyl, chloropropyl, dichloropropyl, chlorobutyl, bromomethyl, bromoethyl, iodomethyl, iodoethyl, fluoromethyl, fluoroethyl, and the like), a cyanoalkyl group having from 2 to 6 carbon atoms (such as cyanomethyl, cyanoethyl, cyanopropyl, cyanobutyl, cyanopentyl, and the like), a hydroxyalkyl group having 1 to 5 carbon atoms (such as hydroxymethyl, hydroxyethyl, hydroxypropyl, hydroxybutyl, hydroxypentyl, 2,3-dihydroxypropyl, and the like), or an acyl group (such as acetyl, propionyl, butyryl, acetoacetyl, benzoyl, 2-carboxybenzoyl, and the like); R₂ represents a hydrogen atom, a halogen atom (such as a chlorine atom, a bromine atom, iodine atom or a fluorine atom) or a nitro group; R₃ and R₄ each represent an alkyl group having from 1 to 5 carbon atoms (such as methyl, ethyl, propyl, butyl or pentyl), an alkoxy group having from 1 to 3 carbon atoms (such as methoxy, ethoxy or propoxy), a nitro group, a halogen atom (such as a chlorine atom, a bromine atom, iodine atom or a fluorine atom) or R

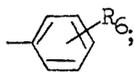
are taken together to form a substituted or unsubstituted benzene ring or a naphthalene ring, in which the substituents are an alkyl group having 1 to 5 carbon atoms (such as methyl, ethyl, propyl, butyl or pentyl), an alkoxy group having 1 to 3 carbon atoms (such as methoxy, ethoxy or propoxy), a nitro group or a halogen atom (such as a chlorine atom, a bromine atom, iodine atom or a fluorine atom); and HX represents a Lewis acid such as HCl, HBr, HI; and X⁻ represents a Lewis acid anion such as Cl⁻, Br⁻, I⁻, BF₄⁻, etc.;

In the above process (A) the reactants are generally used in an equimolar ratio and the reaction is conducted in an inert solvent such as an ester (e.g., ethyl acetate, propyl acetate, butyl acetate, etc.; a cyclic ether (e.g., tetrahydrofuran, etc.) and the like. A suitable temperature is from about -10°C to 20°C, preferably 5°C to 10°C with reaction times of about 5 minutes to 10 hours, more generally 10 minutes to 1 hour. A Lewis acid such as HCl, HBr and HI is generally present during the reaction.

B. (Reaction between an arylaldehyde (IV) and carbonyl group containing carbazole derivative (II))



wherein R₁, R₂ are the same as defined in reaction (A); R₅ represents a hydrogen atom or



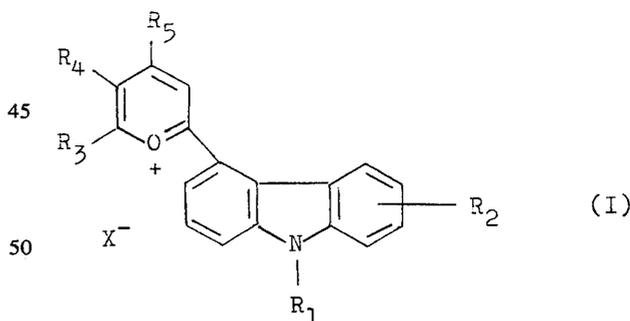
and R₆ represents a hydrogen atom, a halogen atom (such as a chlorine atom, a bromine atom, an iodine atom or a fluorine atom), an alkyl group having 1 to 5 carbon atoms (such as methyl, ethyl, propyl, butyl or pentyl), an amino group or an alkylamino group having 1 to 4 carbon atoms (such as ethylamino, methyl amino, propylamino, dimethylamino diethylamino and the like); and Lewis acid represents HCl, HBr, HClO₄, HNO₃, H₂SO₄, BF₃ or BF₃(C₂H₅)₂O; and X⁻ represents a Lewis acid residue such as Cl⁻, Br⁻, I⁻, ClO₄⁻, NO₃⁻, HSO₄⁻, or BF₄⁻.

The reaction between an arylaldehyde and a carbonyl group containing carbazole derivative represented in the aforesaid reaction schematic (B) is conducted by dissolving both reactants in an equimolar amount in a solvent such as a substituted aromatic hydrocarbon solvent (e.g., nitrobenzene, chlorobenzene, etc.), at a concentration of about 1 to about 20% by

weight, preferably 2 to 10% by weight, adding thereto a Lewis acid, HX, such as HCl, HBr, HClO₄, HNO₃, H₂SO₄, BF₃ or BF₃(C₂H₅)₂O wherein X⁻ represents a Lewis acid residue such as Cl⁻, Br⁻, ClO₄⁻, NO₃⁻, HSO₄⁻ or BF₄⁻, and heating the mixture to about 50°C to about 150°C for about 20 minutes to about 10 hours, more generally, 0.5 to 5 hours. After cooling the reaction mixture to a room temperature (about 15° to 25°C), it is poured into diethyl ether to precipitate the crystals. The thus formed precipitate is filtered out to obtain the end product pyrylium salt. In the case of this reaction, however, it is necessary that the 3-position and the 6-position of the carbazole nucleus be substituted, respectively, by an acetyl group and a substituent other than a hydrogen atom.

The inventors have experimentally confirmed that, when a hydrogen atom is in the 6-position a triaryl-methane dye will be formed under the same reaction conditions.

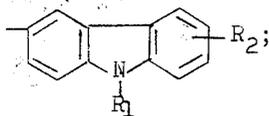
The above-described general formulae (I-A) and (I-B) can be collectively represented by the following general formula (I);



wherein R₁ represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms (such as methyl, ethyl, propyl, butyl or pentyl), an haloalkyl group having 1 to 5 carbon atoms (such as chloromethyl, chloro-ethyl, chloropropyl, dichloropropyl, chlorobutyl, bromomethyl, bromoethyl, iodomethyl, iodoethyl, fluoro-methyl, fluoroethyl, and the like), a cyanoalkyl group having 2 to 6 carbon atoms (such as cyanomethyl, cyanoethyl, cyanopropyl, cyanobutyl, cyanopentyl, and the like), a hydroxyalkyl group having 1 to 5 carbon atoms (such as hydroxymethyl, hydroxyethyl, hydroxypropyl, hydroxybutyl, hydroxypentyl, 2,3-dihydroxypropyl, and the like), or an acyl group (such as acetyl,

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propionyl, butyryl, acetoacetyl, benzoyl, 2-carboxybenzoyl, and the like); R_2 represents a hydrogen atom, a halogen atom (such as a chlorine atom, a bromine atom, iodine atom or a fluorine atom), or a nitro group; R_3 represents



R_4 represents a hydrogen atom or a hydroxy group; or R_3 and R_4 when taken together form a substituted or unsubstituted benzene ring or naphthalene ring, in which the substituents are an alkyl group having 1 to 5 carbon atoms (such as methyl, ethyl, propyl, butyl or pentyl), an alkoxy group having 1 to 3 carbon atoms (such as methoxy, ethoxy, or propoxy), a nitro group, or halogen atom (such as a chlorine atom, a bromine atom, iodine atom or a fluorine atom); R_5 represents a hydrogen atom or



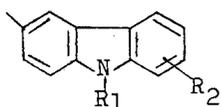
R_6 represents a hydrogen atom, a halogen atom (such as a chlorine atom, a bromine atom, iodine atom or a fluorine atom) or an amino group or an alkylamino group having 1 to 4 carbon atoms (such as ethyl amino, methyl amino, propylamino, dimethylamino, diethylamino and the like), an alkyl group having 1 to 5 carbon atoms (such as methyl, ethyl, propyl, butyl or pentyl); and X represents Cl^- , Br^- , I^- , ClO_4^- , NO_3^- , $H_2SO_4^-$, or BF_4^- .

Preferred substituents for the pyrylium salts of this invention are

for R_1 , a methyl group, an ethyl group or a hydrogen atom,

for R_2 , a hydrogen atom or a bromine atom,

for R_3 , a



group, in which R_1 and R_2 are as defined immediately above,

for R_4 , a hydrogen atom,

for R_3 and R_4 when combined together a benzene ring or a naphthalene ring, in which the substituents of the rings are a nitro group, a bromine atom or a methoxy group,

for R_5 , a hydrogen atom, or a



group

for R_6 , a methoxy group, a bromine atom, a nitro group or a dimethylamino group, and

for X, Cl^- , BF_4^- , or ClO_4^- .

Specific examples of the compounds represented by the general formulae (II), (III) and (IV), set forth in the reaction schematics (A) and (B), are illustrated below.

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General Formula (II): Carbonyl group containing carbazole derivatives

(II-1): 3-Acetylcarbazole

(II-2): 3-Acetyl-9-methylcarbazole

(II-3): 3-Acetyl-9-ethylcarbazole

(II-4): 3-Acetyl-9-chloroethylcarbazole

(II-5): 3-acetyl-9-hydroxyethylcarbazole

(II-6): 3-Acetyl-9-cyanoethylcarbazole

(II-7): 3,9-Diacetylcarbazole

(II-8): 3-Acetyl-6-bromo-9-ethylcarbazole

(II-9): 3-Acetyl-6-chloro-9-ethylcarbazole

(II-10): 3-Acetyl-6-nitro-9-ethylcarbazole

General Formula (III): o-Hydroxyarylaldehydes

(III-1): 2-Hydroxybenzaldehyde

(III-2): 2,4-Dihydroxybenzaldehyde

(III-3): 2-Hydroxy-3-methoxybenzaldehyde

(III-4): 2-Hydroxy-3-bromobenzaldehyde

(III-5): 2-Hydroxy-5-nitrobenzaldehyde

(III-6): 2-Hydroxy- α -naphthoaldehyde

(III-7): 1-Hydroxy- β -naphthoaldehyde

General Formula (IV): Arylaldehydes

(IV-1): Benzaldehyde

(IV-2): Toluinaldehyde

(IV-3): 4-Methoxybenzaldehyde

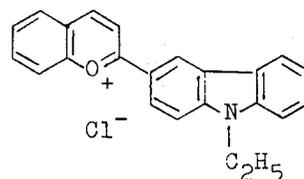
(IV-4): 2-Bromo-4-methoxybenzaldehyde

(IV-5): Nitrobenzaldehyde

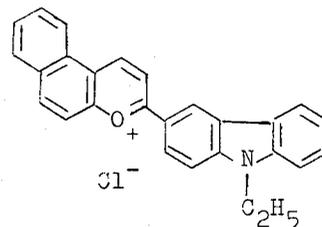
(IV-6): Dimethylaminobenzaldehyde

The reaction between an o-hydroxyarylaldehyde and a carbonyl group containing carbazole derivative represented in the aforesaid reaction schematic (A) is conducted by dissolving both reactants in an organic solvent such as ethyl acetate and, while cooling to about 5° to about 10°C, saturating the mixture with a hydrogen halide under stirring. The reaction time is preferably about 10 minutes to about 1 hour. Upon leaving the reaction mixture for about 5 to about 15 hours, a pyrylium salt is precipitated as crystals. The thus formed precipitate is filtered out to obtain the end product pyrylium salt.

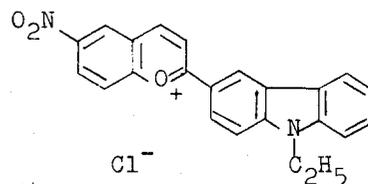
(I-1)



(I-2)



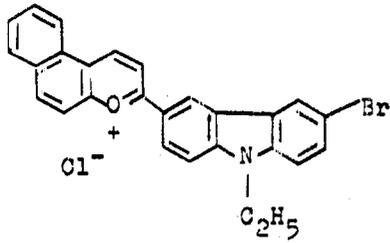
(I-3)



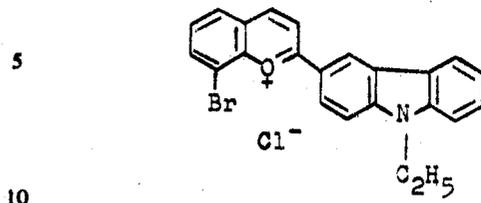
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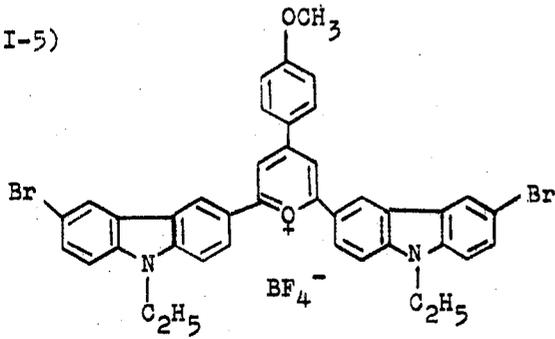
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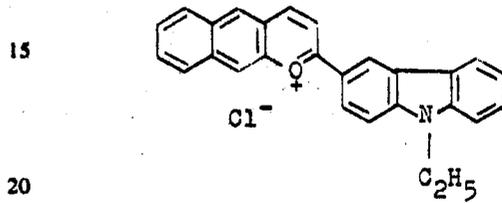
(I-10)



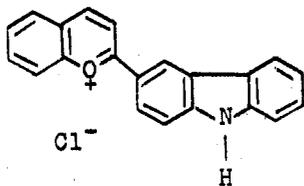
(I-5)



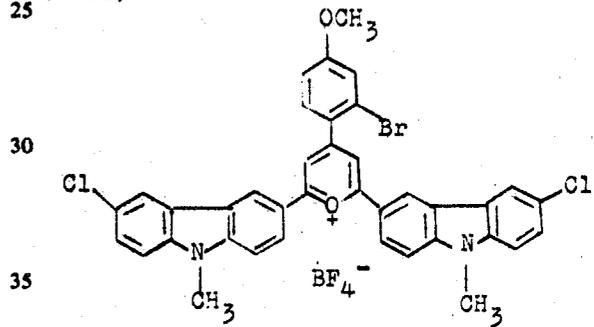
(I-11)



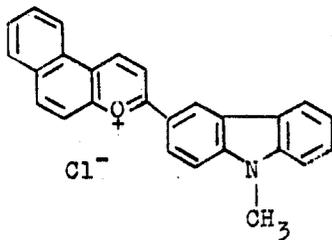
(I-6)



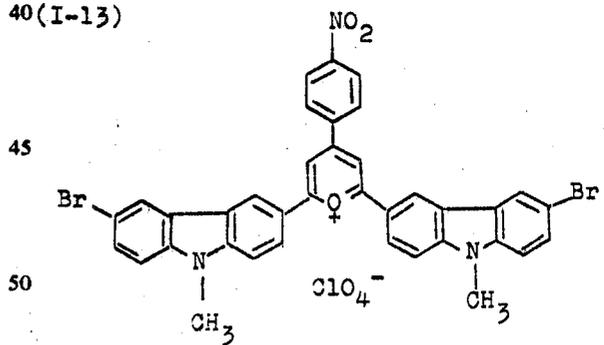
(I-12)



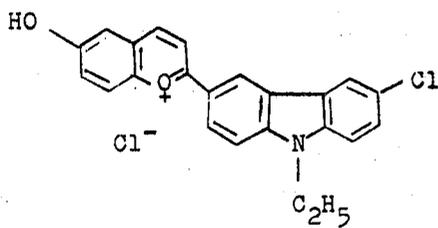
(I-7)



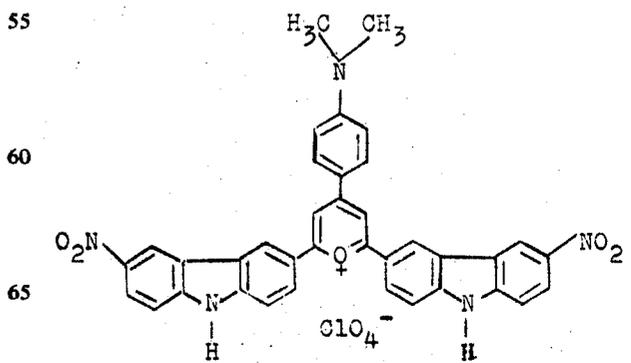
40(I-13)



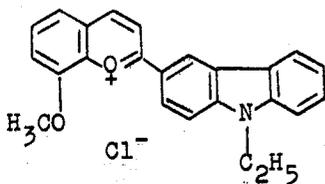
(I-8)



(I-14)



(I-9)

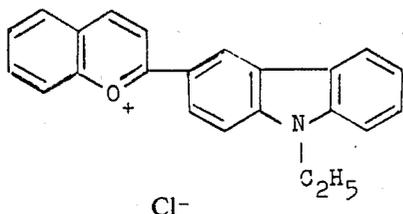


The synthesis of pyrylium salts in accordance with the above-described processes will now be described in greater detail by the following Synthesis Examples.

Synthesis Example 1

4.88 Grams of 2-hydroxybenzaldehyde (II-1) and 9.48 g of 3-acetyl-9-ethylcarbazole (II-3) were dissolved in 400 ml of ethyl acetate, and the total was cooled to 0°C with ice.

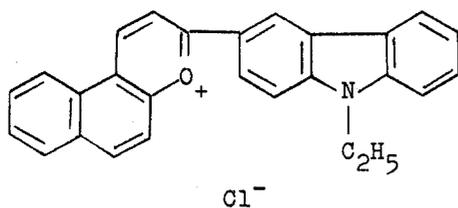
When hydrogen chloride gas was passed there-through, a dark green precipitate was formed. After introducing hydrogen chloride gas for about 20 minutes, the reaction mixture was left overnight. Thereafter, the precipitate formed was filtered out, washed with ethyl acetate, and dried. The thus obtained product was extracted with chloroform, and the extract was concentrated to obtain the end product pyrylium salt. This compound had the following structure:



The absorption maximum wavelength of this compound in chloroform was 537 mμ.

Synthesis Example 2

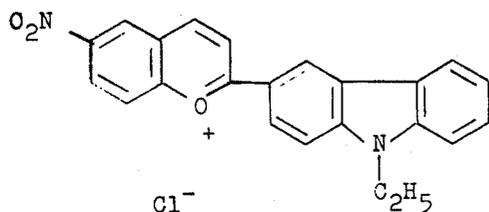
In the same manner as described in Synthesis Example 1 using 2-hydroxy- α -naphthoaldehyde (III-6) and 3-acetyl-9-ethylcarbazole (II-3), a pyrylium salt having the following structural formula was synthesized;



The absorption maximum wavelength of this compound in chloroform was 547 mμ.

Synthesis Example 3

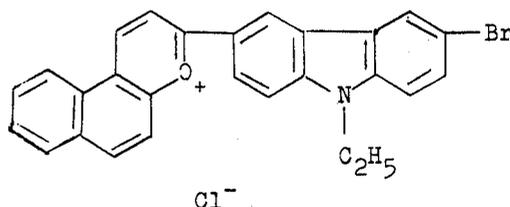
In the same manner as described in Synthesis Example 1 using 2-hydroxy-5-nitrobenzaldehyde (III-5) and 3-acetyl-9-ethylcarbazole (II-3), a pyrylium salt having the following structural formula was synthesized;



The absorption maximum wavelength of this compound in chloroform was 574 mμ.

Synthesis Example 4

In the same manner as described in Synthesis Example 1 using 2-hydroxy- α -naphthoaldehyde (III-6) and 3-acetyl-6-bromo-9-ethylcarbazole (II-8), a pyrylium salt having the following structural formula was synthesized;

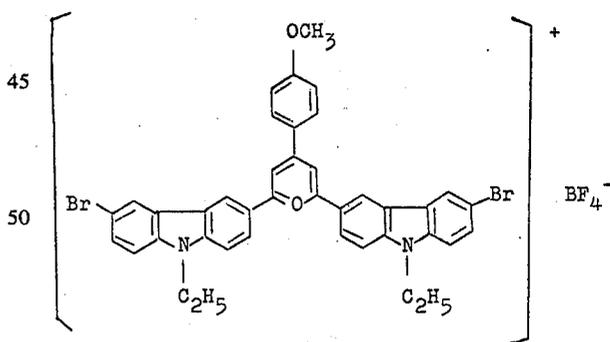


The absorption maximum wavelength of this compound in chloroform was 542 mμ.

Synthesis Example 5

1.4 Grams of 4-methoxybenzaldehyde (IV-3) and 6.3 g of 3-acetyl-6-bromo-9-ethylcarbazole (II-8) were dissolved in 50 g of nitrobenzene and, after adding thereto 100 ml of boron trifluoride ethylate, heated for 2 hours over a water bath. Upon pouring the resulting reaction solution into a large amount of diethyl ether, a precipitate of compound formed was obtained. The precipitate was filtered out, washed with diethyl ether, and dried.

Furthermore, the product was extracted with ether, and the extract was concentrated to obtain the end product pyrylium salt as crystals. From the infrared spectrum thereof, acetyl group was found to have disappeared. Thus, the product appeared to have the following structural formula:

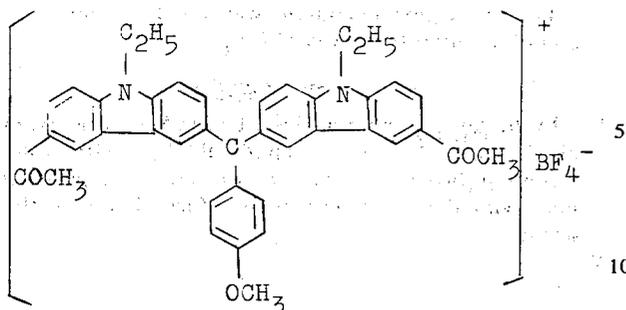


The absorption maximum wavelength of this compound in chloroform was 544 mμ.

Comparative Synthesis Example

The same procedures as described in Example 5 were conducted except for using 3-acetyl-9-ethylcarbazole (II-3) in place of the 3-acetyl-6-bromo-9-ethylcarbazole. Thus, it was found that, since the 6-position is occupied by a hydrogen atom and is therefore reactive, a triarylmethane dye represented by the following structural formula was produced;

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On infrared spectral analysis this compound showed a peak at 1665 cm^{-1} , characteristic of the acetyl group, and the absorption maximum wavelength of the compound in chloroform was $596\text{ m}\mu$. Thus, the compound was tinged blue. (This compound also possesses a sensitizing effect on an organic photoconductive material, and is described in Japanese Patent Application No. 57400/72, (U.S. Ser. No. 367,528, filed June 6, 1973).

The thus obtained carbazole nucleus-containing pyrylium salts show efficient sensitizing effects on various organic photoconductive materials. In particular, they are effective for organic photoconductive materials of the carbazole system such as those described in U.S. Pat. Nos. 3,206,306; 3,240,594; 3,240,595; and 3,704,119, British Patent 964,879, Japanese Patent Publication Nos. 14393/65, and 21054/73, Japanese Patent Application Nos. 74489/70, 50966/72; and the like.

The sensitizer of the present invention is added to an organic photoconductive material in an amount of from 0.01 to 15 wt.%, in particular 0.01 to 10 wt.%, based on the weight of the organic photoconductive material.

The organic photoconductive materials for use in electro photography, sensitized with the sensitizer of the present invention, can be processed in either a dry manner or a wet manner. Specific processing procedures thereof are described in U.S. Pat. Nos. 2,221,776, 2,297,691, 2,907,674, 3,081,263, 3,241,998, and the like. For example, an organic photoconductive material such as poly-N-vinylcarbazole and the pyrylium salts of the present invention are dissolved in an organic solvent such as a halogenated hydrocarbon, e.g., chloroform, methylene chloride, ethylene chloride, and coated on the conductive support so that the dried thickness is about 5 to 50 microns using bar coating.

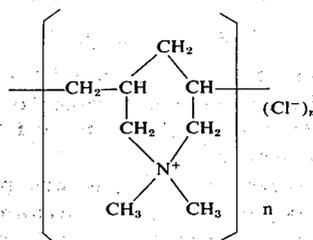
The present invention will now be described in greater detail by the following examples which, however, should not be construed as limiting the invention in any way. Unless otherwise indicated, all percents and parts are by weight.

EXAMPLE 1

A solution, prepared by dissolving 25 g of poly-N-vinylcarbazole (molecular weight: about 300,000) and 50 mg of the pyrylium salt obtained in Synthesis Example 1 in 200 ml of methylene chloride, was coated in a dry thickness of about 10 microns on a paper having been subjected to electroconductivity-imparting processing (by coating thereon Calgonite Conductive Pol-

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mer 261 (trade name produced by the Calgon Corp. and believed to have the following structure



wherein n represents a positive integer, at about 3 g/m^2). In a manner conventional in electro-photography; the thus obtained light-sensitive material was charged in the dark, imagewise exposed in an exposure amount of 490 lx.sec using a white light-emitting source. Upon development-processing of the material, a distinct image was reproduced. Additionally, a developer comprising a carrier of nitrocellulose-coated glass beads of a particle size of 0.4 mm having adsorbed thereon a kneaded mixture of carbon black and polystyrene (5:5 by weight) was used.

The amount of the sensitizer (compound synthesized in Synthesis Example 1) added was varied and the appropriate exposure amount was examined. The results thus obtained are shown in the following Table 1.

Table 1

Amount of Pyrylium Salt Added (mg)	Exposure Amount (lx.sec)
None	20,000
10	1,190
50	190
100	90
200	78
400	52

EXAMPLE 2

The pyrylium salt obtained in Synthesis Example 2 was added to 20 g of a poly-N-vinylcarbazole (as described in Example 1), and the sensitizing effect was examined in the same manner as described in Example 1. The results obtained are shown in the following Table 2.

Table 2

Amount of Pyrylium Salt Added (mg)	Exposure Amount (lx.sec)
None	20,000
1	990
5	110
10	190
20	180
40	240

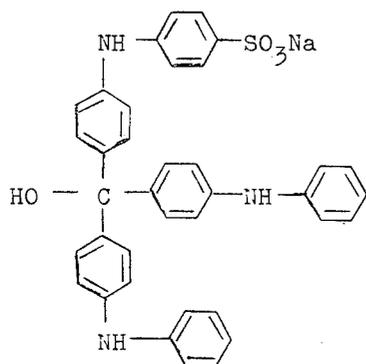
EXAMPLE 3

20 Grams of a poly-N-vinylcarbazole (as described in Example 1) and the compounds listed in Table 3 in the amount given therein were dissolved in 200 ml of methylene chloride. The resulting solution was coated on an aluminum-vacuum deposited polyethylene terephthalate film (Metalumy, made by Toray Industries, Inc.) in

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a dry thickness of 15 microns. In manner common in electro photography, the thus obtained light-sensitive materials were charged in the dark, exposed to a white light-emitting source through an original image, and subjected to a development processing using a liquid developer prepared by dispersing 1 g of a commercially available black offset ink of the following composition in 1 liter of cyclohexane.

Black Offset Ink Composition	
carbon black:	25 parts by weight
alkali blue toner*:	7 parts by weight
rosin modified phenol-formaldehyde resin:	55 parts by weight
Boiled Linseed oil:	13 parts by weight



Thus, distinct images were obtained. The appropriate exposure amounts are given in the following Table 3.

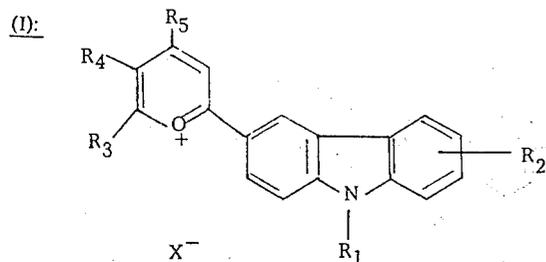
Table 3

Pyrylium Salt	Amount Added (mg)	Exposure Amount (lx·sec)
Synthesis Example 3	200	320
Synthesis Example 4	200	330
Synthesis Example 5	200	15

While the invention has been described in detail and with reference to specific embodiments thereof, it will be apparent to one skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope thereof.

What is claimed is:

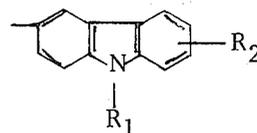
1. An electrophotographic light-sensitive element comprising a support having thereon a layer of an organic photoconductor containing a sensitizer comprising a pyrylium salt containing a carbazole nucleus represented by the following general formula (I):



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wherein R₁ represents a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, a haloalkyl group having from 1 to 5 carbon atoms, a cyanoalkyl group having from 2 to 6 carbon atoms, a hydroxyalkyl group having 1 to 5 carbon atoms, or an acyl group; R₂ represents a hydrogen atom, a halogen atom or a nitro group; R₃ represents

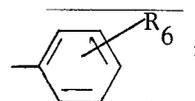
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R₄ represents a hydrogen atom or a hydroxy group; or R₃ and R₄ when taken together form a substituted or unsubstituted benzene or naphthalene ring, said substituents being an alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 3 carbon atoms, a nitro group or a halogen atom; R₅ represents a hydrogen atom or

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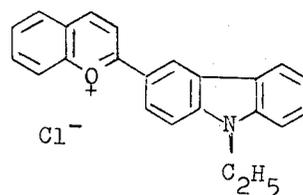
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R₆ represents a hydrogen atom, a halogen atom, an amino group, an alkylamino group having from 1 to 4 carbon atoms or an alkyl group having 1 to 5 carbon atoms; X represents Cl⁻, Br⁻, I⁻, ClO₄⁻, NO₃⁻, HSO₄⁻ or BF₄⁻.

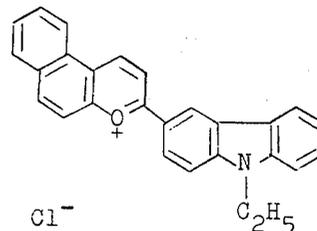
2. The electrophotographic light-sensitive element of claim 1, wherein said organic photoconductor is polyvinyl carbazole.

3. The electrophotographic light-sensitive element of claim 1, wherein said sensitizer is

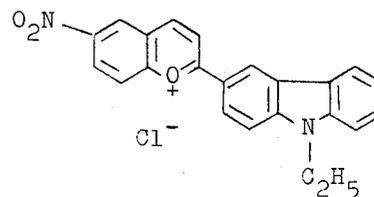
(I-1)



(I-2)



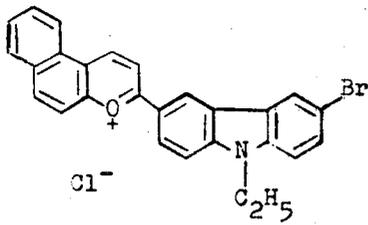
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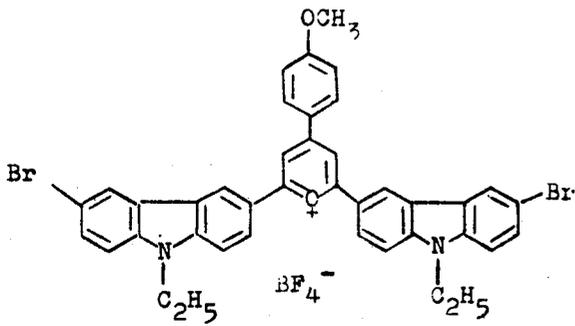
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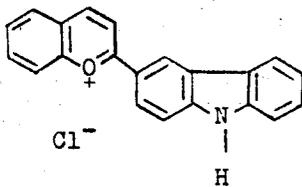
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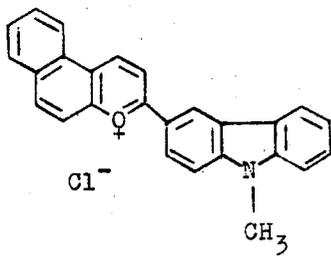
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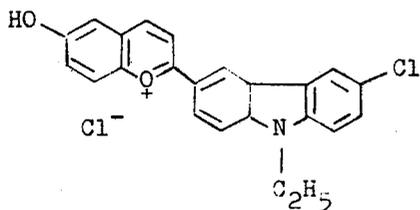
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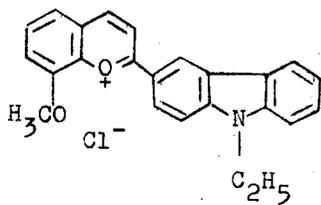
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(I-8)

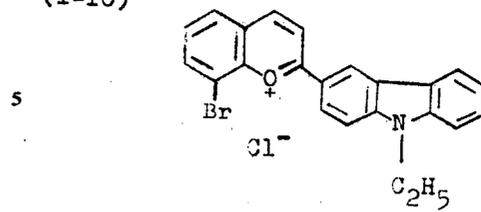


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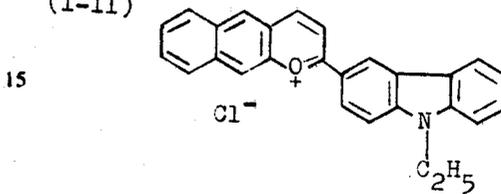
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(I-10)



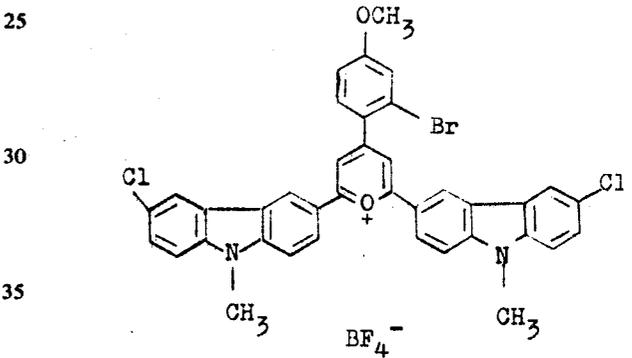
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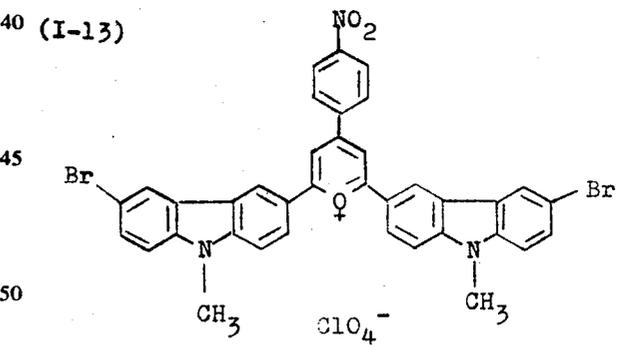
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(I-13)

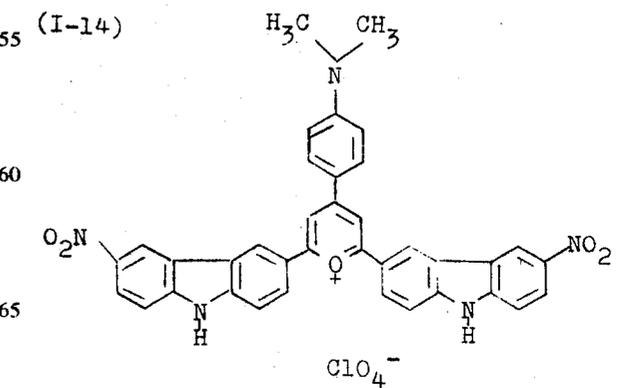


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(I-14)



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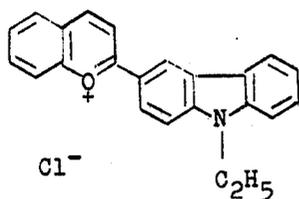
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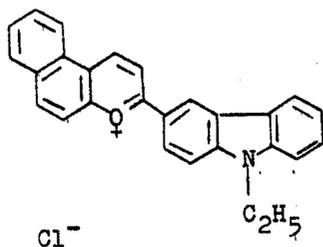
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4. The electrophotographic light-sensitive element of claim 3, wherein said pyrylium salt is

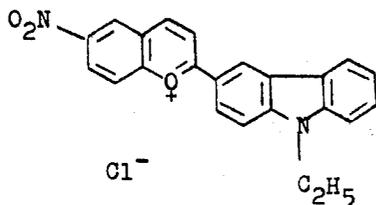
(I-1)



(I-2)



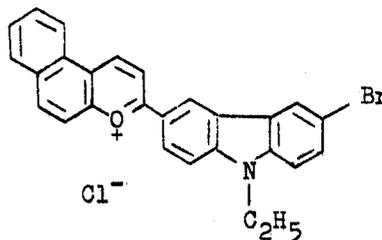
(I-3)



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(I-4)

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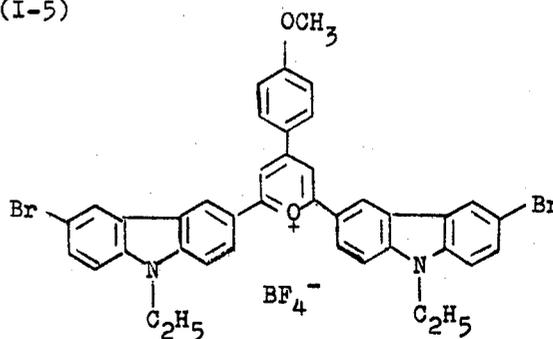


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(I-5)

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5. The electrophotographic light-sensitive element of claim 1, wherein said sensitizer is present in an amount of 0.01 to 15% by weight based on the weight of said organic photoconductor.

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6. The electrophotographic light-sensitive element of claim 1 wherein said layer has a dried thickness of from 5 to 50 microns.

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7. The electrophotographic light-sensitive element of claim 1 where said support is electrically conductive.

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