

# United States Patents Fulltext

Date revised: 4 August 2021

## Description

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Each patent document contains, when available:

- Front-page information, including title, inventor(s), assignee(s), related applications, classification data, cited references, abstract and front page drawing,
- The full specification of the original patent or published application,
- Claims,
- Drawing sheets and inline images,
- Citing patents,
- Post-issuance legal status information for patents that have been reassigned, reexamined, granted an extended beyond the normal 17/20-year period, expired prior to the normal 17/20-year period, or reinstated after late payment of the maintenance fee,
- The LNU complete patent family for each patent document<sup>1</sup>, and
- Legal status information for each member of the patent family<sup>1</sup>.

### Subject Coverage

United.States Patents Fulltext includes all granted U.S. utility patents, published applications, defensive publications, design patents, plant patents, reissue patents, and statutory invention registrations (S.I.R.s).

### Date Coverage

1791–present

### Update Frequency

Twice a week

### Geographic Coverage

U.S. only

### Document Types

Patents

### Publisher

United States Patents Fulltext is produced by LNU. Questions concerning database content should be directed to:

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### Terms & Conditions

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<sup>1</sup> The LexisNexis Univentio complete patent family is a group of patents that share at least one common application or priority application number.

# Sample Document<sup>2</sup>

TI Process for preparing nitrooxyalkyl substituted esters of carboxylic acids, intermediates useful in said process and preparation thereof  
 del Soldato, Piero; Santus, Giancarlo; Benedini, Francesca (Inventors). Nicox S.A. (Assignee). **US 7723382 B2**. (Published 25 May 2010). [Pricing](#)

Patent Citations [Images \(27\)](#) [Family \(38 members\)](#)

Bibliographic information | [Claims](#) | [Legal status](#) | [Specification](#)

**Abstract (summary)** [Translate](#)

AB, TX, FT The present invention refers to a process for preparing a compound of general formula (A), as reported in the description, wherein R is a radical of a drug and R1-R12 are hydrogen or alkyl groups, m, n, o, q, r and s are each independently an integer from 0 to 6, and p is 0 or 1, and X is O, S, SO, SO<sub>2</sub>, NR<sub>13</sub> or PR<sub>13</sub> or an aryl, heteroaryl group, said process comprising reacting a compound of formula (B) R—COOZ (B) wherein R is as defined above and Z is hydrogen or a cation selected from: Li<sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>++</sup>, Mg<sup>++</sup>, tetralkylammonium, tetralkylphosphonium, with a compound of formula (C), as reported in the description, wherein R1-R12 and m, n, o, p, q, r, s are as defined above and Y is a suitable leaving group.

3  **Indexing (details)** [Cite](#)

PA, CO **Assignee** [Nicox S.A.](#) (Non-US Company)  
 ACO Sophia Antipolis - Valbonne, [FR](#)

INV, AU **Inventor** [del Soldato, Piero](#)  
 ICO Monza, [IT](#)  
 IT (Residence)  
[Santus, Giancarlo](#)  
 Milan, IT  
 IT (Residence)  
[Benedini, Francesca](#)  
 Milan, IT  
 IT (Residence)

PBC, PN, KC, PD **Publication number** [US 7723382 B2](#) (25 May 2010)  
 APC, APN, APD **Application number** [US 2006522986](#) (13 September 2006)  
 PPC, PRN, PRD **Priority number** [IT 2002MI1861](#) (29 August 2002)  
**Related publication**

Publication type	Publication number	Publication date	Application number	Application date
PCT	<a href="#">WO 2004020385</a>	11 March 2004	<a href="#">WO 2003EP8700</a>	<a href="#">06 August 2003</a>
Related publication	<a href="#">US 20070112194 A1</a>	17 May 2007		

APC, APNA, APDA

DT,PBC,PNA,PDA

CPC<sup>4</sup> **CPC classification** [C07C 269/06](#) (main); [C07C 67/10](#); [C07C 69/734](#); [C07C 201/02](#); [C07C 203/04](#); [C07C 271/28](#); [C07C 303/28](#)  
[More details](#) ▼

<sup>2</sup>To shorten the display length, the Sample Document shows a portion of the complete Claims, Legal status, Specification, Citations and Family legal status.


<sup>3</sup> Clicking on hyperlinked publication and application numbers automatically searches the numbers in all patent databases.


<sup>4</sup> Clicking on "More details" displays the attribute values assigned to each code; the attribute values are not indexed for searching. This display feature is available for CPC and IPC classifications.

IPC <sup>4</sup>	<b>IPC classification</b>	Version 8: <a href="#">A61K 31/21 (main)</a> ; <a href="#">A61K 31/618 (main)</a> ; <a href="#">A61K 31/40</a> ; <a href="#">C07C 69/00</a> ; <a href="#">C07C 201/08</a> ; <a href="#">C07C 203/04</a> ; <a href="#">A61K 31/216</a> ; <a href="#">C07B 61/00</a> ; <a href="#">C07C 67/10</a> ; <a href="#">C07C 69/734</a> ; <a href="#">C07C 201/02</a> ; <a href="#">C07C 201/04</a> ; <a href="#">C07C 203/00</a> ; <a href="#">C07C 269/06</a> ; <a href="#">C07C 271/28</a> <a href="#">More details</a> ▼
ECLA	<b>ECLA classification</b>	<a href="#">C07C 269/06</a> ; <a href="#">C07C 67/10</a> ; <a href="#">C07C 69/734</a> ; <a href="#">C07C 201/02</a> ; <a href="#">C07C 203/04</a> ; <a href="#">C07C 271/28</a>
USCL	<b>US classification</b>	<a href="#">514/509 (main)</a> ; <a href="#">514/413</a> ; <a href="#">514/418</a> ; <a href="#">534/660</a> ; <a href="#">558/480</a> ; <a href="#">558/482</a> ; <a href="#">560/129</a>
LA	<b>Publication language</b>	English
--	<b>Application language</b>	English
LRP	<b>Legal representative</b>	Arent Fox LLP (Attorney)
EXM	<b>Examiner</b>	Puttlitz, Karl (examiner) USPTO Art Unit: 1621 Cutliff, Yate' K (assistant examiner)
CLFS	<b>US field of search</b>	<a href="#">514/509</a> ; <a href="#">514/413</a> ; <a href="#">514/418</a> ; <a href="#">558/480</a> ; <a href="#">558/482</a> ; <a href="#">560/129</a> ; <a href="#">534/660</a>
NR,NCP,NCBP	<b>Document features</b>	7 literature citations; 23 cited patents; 2 citing patents 27 12 claims; 9 legal status entries
NOC,NLS	<b>Word count</b>	5841
--	<b>Source attribution</b>	United States Patents Fulltext, © Publisher specific
AN	<b>Accession number</b>	US7723382B2
--	<b>Document URL</b>	<a href="http://search.proquest.com/professional/docview/940140071?accountid=160629">http://search.proquest.com/professional/docview/940140071?accountid=160629</a>
FAV	<b>First available</b>	2012-03-25
UD	<b>Updates</b>	2013-01-27 2013-07-09 2013-11-13 2013-12-07 2014-01-29 2014-02-05 2014-07-02 2014-07-10 2014-07-18 2014-07-30
	<b>Database</b>	United States Patents Fulltext

Patent

Citations

 Images (27)

 Family (38 members)

Bibliographic information

Claims

Legal status

Specification

CLM, TX, FT

The invention claimed is:

1. A process for preparing a compound of general formula (A)

[chemical image]

wherein  $R_1$ - $R_{12}$  are the same or different and independently are hydrogen, straight or branched  $C_1$ - $C_6$  alkyl, optionally substituted with aryl;

$m$ ,  $n$ ,  $o$ ,  $q$ ,  $r$  and  $s$  are each independently an integer from 0 to 6, and  $p$  is 0 or 1, and

$X$  is O, S, SO,  $SO_2$ ,  $NR_{13}$  or  $PR_{13}$ , in which  $R_{13}$  is hydrogen,  $C_1$ - $C_6$  alkyl, or  $X$  is selected from the group consisting of:



saturated or unsaturated  $C_5$ - $C_7$  cycloalkylene, optionally substituted with one or more straight or branched  $C_1$ - $C_3$  alkyl groups;

arylene, optionally substituted with one or more halogen atoms, straight or branched alkyl groups containing from 1 to 4 carbon atoms, or a straight or branched  $C_1$ - $C_3$  perfluoroalkyl;

a 5 or 6 member saturated, unsaturated, or aromatic heterocyclic ring selected from

[chemical image]

and  $R$  is the radical of a pharmacologically active compound selected from the group consisting of:

Patent	Citations	 Images (27)	 Family (38 members)
Bibliographic information   <a href="#">Claims</a>   <a href="#">Legal status</a>   <a href="#">Specification</a>			

LD, LSC, LS

Gazette date	Code	Description	Notes/additional information
2014 Jul 15	US FP -	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	Effective: 2014 May 25
2014 May 25	US LAPS -	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
2014 Jan 03	US REMI	MAINTENANCE FEE REMINDER MAILED	
2010 May 25		Date of publication of document granted on or before said date.	
2006 Dec 01	US AS	ASSIGNMENT	Effective: 2006 Nov 07 Assignee: NICOX S.A., FRANCE CHANGE OF ADDRESS;ASSIGNOR:NICOX S.A.;REEL/FRAME:018700/0268
2006 Dec 01	US AS	ASSIGNMENT	Effective: 2006 Nov 07 Assignee: <u>NICOX S.A.,FRANCE</u> CHANGE OF ADDRESS;ASSIGNOR: <u>NICOX S.A.</u> ;REEL/FRAME: <u>018700/0268</u>

REA

PARE

PAOR  
RR

**English:**

TX, FT

**CROSS-REFERENCE TO RELATED APPLICATION**

This application is a National Stage entry of International Application No. PCT/EP2003/008700, filed Aug. 6, 2003, the entire specification and claims of which are incorporated herewith by reference.

The present invention relates to a process for preparing nitrooxyalkyl substituted esters of carboxylic acids, to intermediates useful in said process and to their preparation.

Many carboxylic acid nitrooxyalkyl esters are pharmacologically active products. For example, 1,4-dihydropyridine derivatives having nitrooxy moieties at the C-3 and/or C-5 ester position have shown to be active calcium-channel blockers similar to nifedipine and nicardipine (J. Chem. Soc. Perkin Trans I, 525 (1993)). In literature, several methods for synthesizing nitrooxyalkyl esters are reported. In this way, the nitrooxy moiety may be for example introduced by nucleophilic substitution of a leaving group already present on the alkyl chain of alkyl ester precursor. In particular, 2-(6-methoxy-2-naphtyl)-propionic acid 4-nitrooxybutyl ester has been synthesized reacting 4-chlorobutyl 2-(6-methoxy-2-naphtyl)-propionate with silver nitrate (WO 95/09831), whereas 2-(benzoylphenyl)propionic acid 4-nitrooxybutyl ester (ketoprofen nitrooxybutyl ester) has been prepared reacting the 2-(3-benzoylphenyl)propionic acid sodium salt with 1,4-dibromobutane to give the corresponding bromobutyl ester, which was then treated with silver nitrate to yield the desired nitrooxy derivative. Both processes have the disadvantage that during the introduction of nitrooxy group, impurities of difficult removal are often obtained, such as silver salts (AgCl, AgBr) and silver metal, this being prejudicial to the use of the end-products in therapeutic field, in which an improved purity is always requested.

A further known process for preparing the above mentioned nitrooxyalkyl esters is the insertion of nitrooxyalkyl group by reacting the carboxylic acid or a derivative thereof (halide) with a nitrooxyalkyl alcohol or with a nitrooxyalkyl bromide. For example, 2-(S)-(6-methoxy-2-naphtyl)-propionic acid 4-nitrooxybutyl ester is prepared treating the corresponding acid chloride with 4-nitrooxybutan-1-ol in methylene chloride and in presence of potassium carbonate (WO 01/10814). This method has also the disadvantage that several by-products are formed, being in fact very difficult to obtain nitrooxyalkyl alcohols and the acyl halide in a pure form; moreover, for example 4-nitrooxybutan-1-ol is stable only in solution and it cannot be isolated as a pure substance.

It was thus an object of the present invention to provide a new process for preparing carboxylic acid nitrooxyalkyl esters not having the above mentioned disadvantages and wherein impurities and by-products

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2 Cited patents

This patent's list of citations includes the patents below (backwards citations).

**Cited by other (4 patents)**

3  
CTPN,PAR,REF

Publication number
<a href="#">WO 95009831 A1</a>
<a href="#">WO 95030641 A</a>
<a href="#">WO 98007701 A</a>
<a href="#">WO 01010814 A1</a>

**Cited by examiner (19 patents)**

CTINV  
CTPN  
PAR, REF

Publication number	Publication date	Inventor
<a href="#">US 5700947 A</a>	1997 Dec 23	<u>Soldato</u>
<a href="#">US 5780495 A</a>	1998 Jul 14	Del Soldato
<a href="#">US 5861426 A</a>	1999 Jan 19	Del Soldato et al.
<a href="#">US 6040341 A</a>	2000 Mar 21	Del Soldato et al.

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5 Cited literature

This patent's list of citations includes the literature references below (backwards citations).

Tip: Use the **Look up citation** search form to find these documents, after selecting all databases.

**Cited by other (5 references)**

NPL, REF

1. Database Online-Chemical Abstracts Service; Movsumzade, et al.; "Effect of Bromine Nitrate on Olefin-Oxirane Mixtures"; 1975.
2. Database Online-Chemical Abstract Service; McKillop, et al.; "Mercury-Assisted Solvolyses of Alkyl Halides. Simple Procedures for the Preparation of Nitrate Esters Acetate Esters, Alcohols, and Ethers"; 1974.
3. Chemical and Pharmaceutical Bulletin; Ogawa, et al.; "Synthesis and Antihypertensive Activities of New 1,4-Dihydropyridine Derivatives Containing Nitrooxyalkylester Moieties at the 3-And 5-Positions"; vol. 41; No. 6; pp. 1049-1054; Jun. 1993.
4. Journal of Medicinal Chemistry, American Chemical Society; Kawashima; "Synthesis and Pharmacological Evaluation of (Nitrooxy)alkyl Apovincaminates"; vol. 36, pp. 815-819; 1993.
5. T. Ogawa et al., "Synthesis and Configurational Assignment of Methyl 3-Nitrooxypropyl 1,4-Dihydro-2,6-dimethyl-4-(3-nitrophenyl)pyridine-3,5-dicarboxylate", J. Chem. Soc. Perkin Trans. pp. 525-528, 1993.

<sup>5</sup> Clicking on hyperlinked journal titles automatically searches the journal title in all general (non-patent) databases.

Patent Citations **Images (27)** **Family (38 members)**

[Cited references](#) | [Citing patents](#)

2

### Citing patents (2)

This patent is cited by the patents below (forwards citations).

Publication number	Publication date
<a href="#">US 8062653 B2</a>	2011 Nov 22
<a href="#">US 8303978 B2</a>	2012 Nov 06

CGPN

PAR, REF

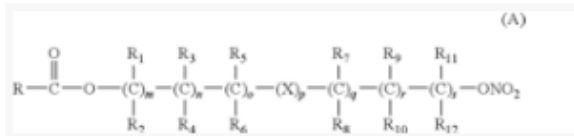
6

Patent Citations **Images (27)** **Family (38 members)**

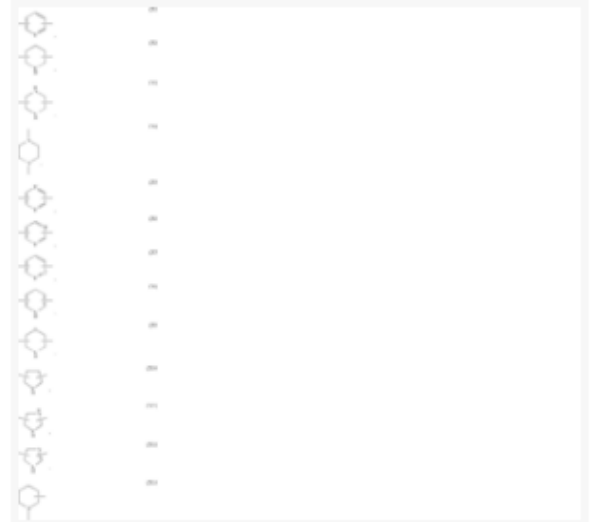
**Images**

Showing 20 of 27 images( [Link to PDF for the full patent including all images](#) )

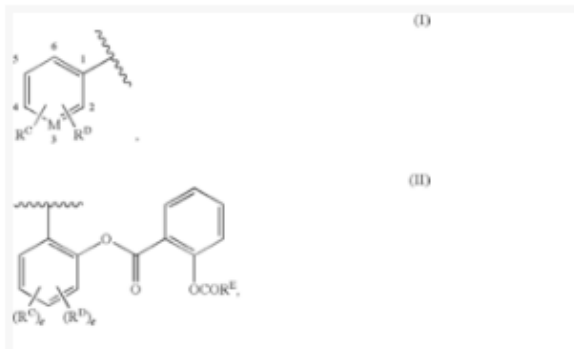
### Inline images



Chemical image



Chemical image



⋮

<sup>6</sup> Clicking on an image will launch a full size image viewer.



CFID  
FID  
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1,3,7

Patent	Citations	Images (27)	Family (38 members)			
Family members (38)		Family legal status				
<b>Complete family</b>						
Complete family ID: 160069931						
Simple family ID: 133531253						
Includes: 38 patents; 20 countries						
	Publication number	Kind	Publication date	Application number	Application date	Type
+	<a href="#">IT 2002MI1861</a>	A1	20040228	<a href="#">IT 2002MI1861</a>	20020829	B
+	<a href="#">WO 2004020384</a>	A1	20040311	<a href="#">WO 2003EP8698</a>	20030806	
+	<a href="#">CA 2497187</a>	A1	20040311	<a href="#">CA 2497187</a>	20030806	
+	<a href="#">WO 2004020385</a>	A1	20040311	<a href="#">WO 2003EP8700</a>	20030806	
+	<a href="#">AU 2003266966</a>	A1	20040319	<a href="#">AU 2003266966</a>	20030806	
+	<a href="#">AU 2003266261</a>	A1	20040319	<a href="#">AU 2003266261</a>	20030806	
+	<a href="#">EP 1532098</a>	A1	20050525	<a href="#">EP 2003747879</a>	20030806	
+	<a href="#">EP 1537070</a>	A1	20050608	<a href="#">EP 2003790866</a>	20030806	
+	<a href="#">KR 1020050057057</a>	A	20050616	<a href="#">KR 1020057003509</a>	20030806	
Title		PROCESS FOR PREPARING NITROOXYDERIVATIVES OF NAPROXEN				
Assignee		NICOX S.A. (니콕스 에스. 에이.) 프랑스 예프-06906 소피아 안티폴리 바티몽 I 에스박스 가이마 II 루프 데 돌린느 2455, FR 000-000				
Inventor		DEL SOLDATO PIERO (델 솔다토 피에로) 이탈리아공화국 I-20052 몬자 비아 이. 토티 22, IT SANTUS GIANCARLO (산투스 기안카를로) 이탈리아공화국 I-20146 밀라노 비아 주아라 8, IT BENEDINI FRANCESCA (베네디니 프란체스카) 이탈리아공화국 I-20132 밀라노 비아 파도바 286, IT				
Priority number		<a href="#">IT 2002MI1861</a> (29 August 2002)				
CPC classification		C07C 67/10; C07C 69/734; C07C 201/02; C07C 203/04; C07C 269/06; C07C 271/28				
IPC classification		Version 8: A61K 31/618 (main); C07C 201/08; A61K 31/216; C07B 61/00; C07C 67/10; C07C 69/734; C07C 201/02; C07C 201/04; C07C 203/00; C07C 203/04; C07C 269/06; C07C 271/28 Version 1-7: C07C 201/02 (main); C07C 203/04				
Publication language		Korean				
Document features		9 claims; 1 legal status entries				
Abstract		English: The present invention refers to a process for preparing a compound of general formula (A), wherein R is a radical of naproxen or bromonaproxen and R <sub>1</sub> -R <sub>12</sub> are hydrogen or alkyl groups, m, n, o, q, r and s are each independently an integer from 0 to 6, and p is 0 or 1, and X is O, S, SO, SO <sub>2</sub> , NR <sub>13</sub> or PR <sub>13</sub> or an aryl, heteroaryl group, said process comprising reacting a compound of formula (B) : R-COOZ wherein R is as defined above and Z is hydrogen or a cation selected from: Li+, Na+, K+,...				
+	<a href="#">CN 1678560</a>	A	20051005	<a href="#">CN 2003820605</a>	20030806	

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<sup>7</sup> The complete set of patent family members for the patent document are displayed in a table (sorted by publication date). To view the bibliographic details of a member, expand the table entry by clicking on the "plus" sign preceding the publication number.

3.8

Patent	Citations	Images (27)	Family (38 members)	
Family members (38)   Family legal status				
<b>Legal status - complete family</b>				
Patent number	Gazette date	Code	Description	Notes/additional information
<a href="#">RU 2315035 C2</a>	27 Jun 2014	RU MM4A -	THE PATENT IS INVALID DUE TO NON-PAYMENT OF FEES	Effective: 2013 Aug 07
<a href="#">RU 2315035 C2</a>	20 Jan 2008		Date of publication of document granted on or before said date.	
<a href="#">RU 2315035 C2</a>	20 Jan 2008		Publication Of Grant Date	
<a href="#">RU 2315035 C2</a>	20 Nov 2005		Date of publication of unexamined document not granted on or before said date.	
<a href="#">CA 2497187 C</a>	18 Sep 2014	CA MKLA -	LAPSED	Effective: 2014 Aug 06
<a href="#">CA 2497187 C</a>	25 Sep 2012		Date of publication of document granted on or before said date.	
<a href="#">CA 2497187 C</a>	25 Sep 2012		Publication Of Grant Date	
<a href="#">CA 2497187 C</a>	25 Sep 2012		Assignment	Assignee: BENEDINI, FRANCESCA Grantee from 20050815; Reel/Frame: 000000/0000

## Search fields

Field Name	Field Code	Search examples <sup>9</sup>	Description and Notes
Abstract	AB	ab>(*ammonium)	Use adjacency and/or Boolean operators to narrow search results.
Abstract present	ABANY	tetralkylphosphonium AND abany(yes)	Add: AND ABANY(YES) to a query to limit retrieval to records with abstracts.
Accession number	AN	an(US7723382B2)	A unique document identification number assigned by the information provider.
All fields	ALL	all(Li Na K Ca Mg)	All fields <i>except</i> the full text. Use proximity and/or Boolean operators to narrow search results.
All fields + text	--	Li AND Na AND K AND Ca AND Mg	Using no field code searches all fields including the full text.
Any number, in many formats	PNUM	pnum(US7723382) pnum(US7723382 B2) pnum(7723382)	Publication, application, priority application, related application, and related publication number. Includes various forms of the number. Search cited and citing publication numbers with CTPN and CGPN.
Application country	APC	apc(us)	Application, priority application, and related application country.

<sup>8</sup> The complete set of legal status actions for each patent family member are displayed.

<sup>9</sup> Most, but not all, of the search examples are from the sample record.

Field Name	Field Code	Search examples <sup>9</sup>	Description and Notes
Application date	APD	apd(20060913)	The main application date.
Application dates – all	APDA	apda(2003-08-06) apda(20030806)	Application, priority, and related application dates.
Application number	APN	apn(US 2006522986)	The main application number.
Application numbers – all	APNA	apna(IT 2002MI1861)	Application, priority application, and related application numbers.
Assignor	PAOR	paor("DEL SOLDATO, PIERO")	An assignor is a former assignee transferring rights to a new assignee (PARE).
Author	AU	au(Santus, Giancarlo)	Author names in patent databases are inventors but can be searched using the AU field code.
Cited and citing patent references	PAR	par(WO 95009831) par(US 7186753) par(Letts)	Cited and citing patent references, but not cited literature.
Cited non-patent literature	NPL	npl(Ogawa) npl("Bromine Nitrate")	Cited literature references.
Cited patent publication date	CTDA	ctda(19971223)	The publication date of a cited patent in the document.
Cited patent publication number	CTPN	ctpn(US 6040341 A) ctpn(6040341) ctpn(US 6040341)	Includes enhanced/variant forms of the number.
Cited references – all	REF	ref(WO98007701) ref(US8062653) ref("Medicinal Chemistry")	Cited/citing patent and cited literature references.
Citing patent publication date	CGDA	cgda(20111122)	The publication date of a citing patent in the document.
Citing patent publication number	CGPN	cgpn(US 8062653 B2) cgpn(US 8062653) cgpn(8062653)	Includes enhanced/variant forms of the number.
Claims	CLM	clm("ferulic acid")	Claims are the legal text describing the patent.
Classification – CPC <sup>10</sup>	CPC	cpc(C07C 69/734) cpc(C07C 69) cpc(C07C) cpc(C07) cpc(C)	The Cooperative Patent Classification (CPC) is available for searching from March 2013 forward.
Classification – ECLA	ECLA	ecla(C07C 201/02) ecla(C07C 201) ecla(C07C) ecla(C07) ecla(C)	European Class codes.
Classification – IPC <sup>11</sup>	IPC	ipc(C07C 69/734) ipc(C07C 69) ipc(C07C) ipc(C07) ipc(C)	International Patent Class codes. IPC Version 7 and earlier is used prior to 2006. The IPC Version 8 is used from 2006 forward.
Classification – US	USCL	uscl(514/509) uscl(514)	National Class codes (United States).

<sup>10</sup> The Cooperative Patent Classification (CPC) was introduced in January 2013. It is structurally similar to the International Patent Classification (IPC), so CPC classes are searched the same way using the CPC field code. CPC attributes are the same as the IPC attributes with the exception of the Value attribute (I - Inventive, A - Additional).

<sup>11</sup> IPC Version 7 and earlier is used from 1970 through 2005. IPC Version 8 is used from 2006 forward. With the introduction of the Reformed International Patent Classification (IPCR/8) on January 1, 2006, the format of the IPC group increased in length from 3 to 4 digits. For comprehensive retrieval, both forms of the classification codes should be searched. Some records may contain IPCR/8 codes as well as earlier versions of IPC codes, indicating that an older patent has been reclassified. Each IPCR/8 classification code is also assigned a series of attributes. These include classification level (A - Advanced, C - Core, S - Subclass), value (I - Inventive, N - Non-inventive), position (F - First, L - Later), status (B - Basic, R - Reclassified, V - Various, D - Deleted), version date, action date, source (H - Human, M - Machine, G - Generated), and assigning office.

Field Name	Field Code	Search examples <sup>9</sup>	Description and Notes
Company information	CO	co("Nicox S.A.")	The as-published patent assignee, new assignee and assignor.
Document text	TX	tx("nitrooxyalkyl substituted esters") tx(nitrooxy* NEAR/5 ester?)	Abstract, claims, and specification. Use adjacency and/or Boolean operators to narrow search results. May also search using FT.
Document type	DTYPE	dtype(patent)	The only document type in United States Patents Fulltext is "patent".
Examiner	EXM	exm(Puttlitz, Karl) exm(1621)	Examiner and examiner reference code (USPTO Art Unit). Not available for published applications.
Family ID – complete	CFID	cfid(160069931)	A complete family ID is a type of accession number assigned to any patents that share at least one common application or priority application number.
Family ID – simple	FID	fid(133531253)	A simple family ID is a type of accession number assigned to any patents that share an identical priority application number.
First available	FAV	fav(20120325)	Indicates the first time a document was loaded in a database. It will not change however many times the record is subsequently reloaded.
From database <sup>12</sup>	FDB	nitrooxy* N/5 ester AND fdb(1008365)	Useful in multi-database searches to isolate records from a single database. FDB cannot be searched on its own; specify at least one search term then AND it with FDB.
Full text	FT	ft("nitrooxyalkyl substituted esters") ft(nitrooxyalkyl substituted esters)	Abstract, claims, and specification. May also search using TX.
Full text present	FTANY	ft(nitrooxyalkyl substituted esters) AND ftany(yes)	Add: <i>AND FTANY(YES)</i> to a query to limit your search to documents with full text (i.e., Specification)
Image present	IMGANY	ft(nitrooxyalkyl substituted esters) AND imgany(yes)	Add: <i>AND IMGANY(YES)</i> to a query to limit your search to documents with an image.
Inventor	INV	inv(Santus, Giancarlo)	May also search inventor names using the AU field code.
Inventor country	ICO	ico(IT)	
Language	LA	la(english)	The language in which the document was originally published.
Language of abstract	SL	sl(english)	
Legal representative	LRP	lrp(Arent Fox)	The legal representative, attorney, agent, or firm who represents the patent assignee.
Legal representative location	LRL	lrl(CA)	The mailing address if available.
Legal status	LS	ls(lapse) ls("US AS") ls(20140715) ls("CONFIDENTIALITY AGREEMENT")	Legal status Gazette date, code, code description, and notes.
Legal status code	LSC	lsc("US AS") lsc(Assignment) lsc(FP) LNK Id(2014)	Legal status code and code description. Use the LNK operator to search legal status data from a specific legal status entry.
Legal status date	LD	ld(201407) ld(20140715)	Legal status Gazette date and effective date in notes.
New assignee	PARE	pare(NICOX)	The name of the patent assignee who is receiving transfer rights from an assignor (PAOR).
Number of cited literature references	NR	nr(>5) nr(7)	NR is a numeric field so using "greater than" (>) and "less than" (<) symbols, for example, is possible.
Number of cited patents	NCP	ncp(23) ncp(22 OR 23 OR 24)	NCP is a non-numeric field; using symbols such as "greater than" (>), "less than" (<) is not possible.
Number of citing patents	NCBP	ncbp(2)	NCBP is a non-numeric field; using symbols such as "greater than" (>), "less than" (<) is not possible.

<sup>12</sup> FDB searches the database ID. Click the "Field codes" hyperlink at the top right of the Advanced Search page. Click "Search syntax and field codes", then click on "FDB command" to get a list of database names and codes that can be searched with FDB.

Field Name	Field Code	Search examples <sup>9</sup>	Description and Notes
Number of claims	NOC	noc(1-25) noc(>10)	NOC is a numeric field; using "greater than" (>) and "less than" (<) symbols, for example, is possible.
Number of legal status entries	NLS	nls(<=10) nls(1-10)	NLS is a numeric field; using "greater than" (>) and "less than" (<) symbols, for example, is possible.
Patent assignee	PA	pa("NICOX ")	The as-published applicant or patent assignee names.
Patent assignee country	ACO	aco(fr)	The mailing address country for the patent assignee consisting of the ISO-standard 2-letter country code.
Patent publication country	PBC	pbcc(us)	The 2-letter ISO standard country code for the main publication and related publication country.
Patent publication country and kind code	KC	kc(us b2) kc(us)	The kind code indicates the publication level of a patent document. KC searches main publication country and kind code, or the country only.
Patent publication country and kind code – all	KCA	kca(US B*) kca(US)	The kind code indicates the publication level of a patent document. KCA searches the main or related publication country with kind code, or the country only.
Patent publication date	PD	pd(20100525) pd(201005)	Main publication date.
Patent publication dates – all	PDA	pda(2010) pda(20040311)	Main and related publication dates.
Patent publication number	PN	pn(US 7723382B2) pn(US 7723382)	Main publication number.
Patent publication numbers – all	PNA	pna(US 7723382) pna(WO2004020385)	Main and related publication numbers.
Patent title	TI	ti(nitrooxyalkyl substituted esters)	
Priority application country	PPC	ppc(it)	The 2-letter ISO-standard country code associated with the priority application number.
Priority application date	PRD	prd(20020829) prd(200208)	The 8-digit date assigned to a priority application number.
Priority application number	PRN	prn(IT 2002MI1861)	The priority application number is the number assigned to the original or first application.
Publication title	PUB	pub(United States Patents Fulltext)	In a patent database, the publication title is generally the database name.
Publication type	PT	pt("Government & Official Publications")	The only publication type in United States Patents Fulltext is "Government & Official Publications".
Reassignment date	RAD	rad(20061201) rad(2006-12-01)	The effective date of a reassignment.
Reassignment information	REA	rea(20050714) rea("NON-COMPT. & CONFIDENTIALITY AGREEMENT") rea(NICOX)	Reassignment effective date, new assignee, assignor, reel/frame, and assignment description.
Reel and frame	RR	rr(016994/0054)	Reel/frame data is available in the legal status.
Related publication and application type	DT	dt(PCT) dt("Related publication")	The type of related publication and application, such as PCT, Continuation in part, etc.

Field Name	Field Code	Search examples <sup>9</sup>	Description and Notes
Relevance category	RI	ri(a)	A cited reference may include single letter codes that indicate how it is relevant to the patent.
Specification	SPEC	spec(objet cylindrique)	The specification of the patent. To search all text (abstracts, claims, specification), use the TX or FT field code.
Updates	UD	ud(20140730)	The date(s) the record was loaded as a result of an update provided by the supplier.
US field of search	CLFS	clfs(514/509) clfs(514)	Class codes used by examiners for their prior art search report.

## Search tools

Field codes are used to search document fields, as shown in the sample document. Field codes may be used in searches entered on the **Basic Search, Advanced Search, Command Line** and **Look Up Patent** search pages. **Limit options, Look up lists, Patent families option, “Narrow results by” filters,** and **Look up patent** tools are also available for searching. Some data can be searched using more than one tool.

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Document format	Description	Online	Export/Download <sup>13</sup>
Brief view result listing <sup>14</sup>	Original patent title, assignee, inventor, patent number and kind, date, database name.	✓	✓
Detailed view result listing <sup>14</sup>	Brief view plus a 3-line KWIC window, front page drawing, number of citations, number of citing patents, and the number of legal status entries.	✓	
KWIC (Keyword in context)	Detailed view plus all occurrences of your search terms, highlighted within the fields where the terms occur.	✓	✓
Preview <sup>14</sup>	Brief view plus the abstract, front page drawing, IPCs and US class codes.	✓	
Brief citation	Bibliographic information (title, assignee, inventor, publication number and date, application number and date, priority application number and date, related filing details, IPC, CPC, ECLA and US classifications, legal representative, publication and application languages, document features, source attribution, accession number, document URL, update dates, database name), images, patent family members and family legal status	✓	✓
Citation/Abstract	Bibliographic information, abstract, front page drawing, legal status, cited references, images, patent family members and family legal status. A Citation only format is offered when the abstract is not available.	✓	✓
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