US009409894B2

(12) **United States Patent**
Dochnahl et al.

(10) **Patent No.: US 9,409,894 B2**
(45) **Date of Patent: Aug. 9, 2016**

(54) **CARBAMATES**

(71) Applicant: **BASF SE**, Ludwigshafen (DE)

(72) Inventors: **Maximilian Dochnahl**, München (DE); **Roland Götz**, Neuluβheim (DE); **Joachim Gebhardt**, Wachenheim (DE); **Uwe Josef Vogelbacher**, Ludwigshafen (DE); **Timo Frassetto**, Mannheim (DE); **Michael Rack**, Eppelheim (DE); **Volker Maywald**, Ludwigshafen (DE); **Bernd Wolf**, Niederkirchen (DE)

(73) Assignee: **BASF SE**, Ludwigshafen (DE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/421,321**

(22) PCT Filed: **Jul. 29, 2013**

(86) PCT No.: **PCT/EP2013/065872**
§ 371 (c)(1),
(2) Date: **Feb. 12, 2015**

(87) PCT Pub. No.: **WO2014/026845**
PCT Pub. Date: **Feb. 20, 2014**

(65) **Prior Publication Data**

US 2015/0218139 A1 Aug. 6, 2015

Related U.S. Application Data

(60) Provisional application No. 61/684,159, filed on Aug. 17, 2012.

(30) **Foreign Application Priority Data**

Aug. 17, 2012 (EP) 12180823

(51) **Int. Cl.**

C07C 335/28	(2006.01)
C07C 275/60	(2006.01)
C07D 265/36	(2006.01)
C07D 413/04	(2006.01)

(52) **U.S. Cl.**
CPC ***C07D 413/04*** (2013.01); ***C07C 275/60*** (2013.01); ***C07C 335/28*** (2013.01); ***C07D 265/36*** (2013.01)

(58) **Field of Classification Search**
CPC ... C07D 413/04; C07D 265/36; C07C 335/28
USPC 544/105, 221, 222; 564/23
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,372,180	A	3/1968	Ulrich
3,392,184	A	7/1968	Ulrich et al.
4,418,073	A	11/1983	Maurer et al.
4,426,523	A	1/1984	Dickore et al.

FOREIGN PATENT DOCUMENTS

EP	0 043 917	1/1982
EP	0 079 515	5/1983
WO	WO 2010/145992	12/2010
WO	WO 2011057935	5/2011
WO	WO 2013092858	6/2013
WO	WO 2014026928	2/2014

OTHER PUBLICATIONS

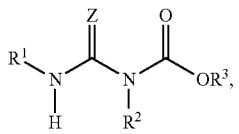
PubChem CID 53811040, Create Date: Dec. 4, 2011.*
PubChem Search Results, Sep. 5, 2015.*
International Search Report, PCT/EP2013/065872, filed Jul. 29, 2013, report completed Aug. 30, 2013.
International Preliminary Report on Patentability, PCT/EP2013/065872, filed Jul. 29, 2013, report completed Dec. 5, 2014.
European Search Report, EP12180823, search completed Nov. 21, 2012.
Andreani et al., "One-step synthesis and isolation of N-(tert.-butoxycarbonyl)-N'-methylthiourea on a large scale", Synthetic Communications, vol. 38, 2008, pp. 3834-3839.
Database Beilstein, Beilstein Institute for Organic Chemistry, Frankfurt, Germany, 1971, XP002712030.
Black et al., "Guanidino N-Substituted and N,N-Disubstituted Derivatives of the *K*-Opioid Antagonist GNTI", Journal of Medical Chemistry, vol. 46, 2003, pp. 5505-5511.
Biltz et al., "Substituted biurets and allophanic esters", Chemische Berichte, vol. 56, 1923, pp. 1914-1926.
Dains et al., "The action of ammonia and amines on the substituted areas and urethanes", Journal of the American Chemical Society, vol. 42, 1920, pp. 2303-2309.
Étienne et al., "No. 304—Diméthyl-3,5 trioxo-2,4,6 perhydro-oxadiazine-1,3,5 et dérivés (*)", Bulletin de la Societe Chimique de France, Jan. 1, 1974, pp. 1497-1505.
Linton et al., "A versatile one-pot synthesis of 1,3-substituted guanidines from carbamoyl isothiocyanates", The Journal of Organic Chemistry, vol. 65, No. 5, Mar. 10, 2003, pp. 1566-1568.
March, Advanced Organic Chemistry, 2nd Ed., McGraw-Hill, 1977, p. 823, XP002687672.
Etienne et al., "Organic Chemistry—1,3-Diallyl 5 aryl Isocyanurates," C.R. Acad. Sc. Paris, Sep. 1, 1975, Series C-275, vol. 281.
Office Action dated Sep. 9, 2015 in U.S. Appl. No. 14/421,351.

* cited by examiner

Primary Examiner — Venkataraman Balasubramanian
(74) *Attorney, Agent, or Firm* — Brinks Gilson & Lione

(57) **ABSTRACT**

The present invention relates to carbamates of formula (I),



(I)

wherein the variables are defined according to the description,

as well as to a process for manufacturing carbamates of formula (I), and to the use of carbamates of formula (I) in manufacturing benzoxazinones of formula (VII).

8 Claims, No Drawings