

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 December 2002 (27.12.2002)

PCT

(10) International Publication Number
WO 02/102750 A3

(51) International Patent Classification⁷: C07C 19/01,
17/278, 17/272

(81) Designated States (*national*): JP, MX.

(21) International Application Number: PCT/US02/18253

(84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

(22) International Filing Date: 12 June 2002 (12.06.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/880,010 14 June 2001 (14.06.2001) US

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations JP, MX, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

(71) Applicant: VULCAN CHEMICALS [US/US]; A Business Group of Vulcan Materials Company, 1200 Urban Center Drive, Birmingham, AL 35242 (US).

Published:

- with international search report

(72) Inventor: BRANAM, Lloyd, B.; 1543 N. Gow, Wichita, KS 67203 (US).

(88) Date of publication of the international search report:
27 March 2003

(74) Agents: REA, Teresa, Stanek et al.; BURNS, DOANE, SWECKER & MATHIS, L.L.P., P.O. Box 1404, Alexandria, VA 22313-1404 (US).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WATER-ENHANCED PRODUCTION OF 1,1,1,3,3-PENTACHLOROPROPANE

(57) Abstract: A process is provided by which addition of water is used to enhance the production of any hydrochlorocarbon feedstock through the use of Kharasch chemistry, i.e. the combination of a polychlorinated alkane with an olefin to produce a chlorinated or hydrochlorinated alkane with the use of a transition metal compound in homogeneous solution as catalyst. Preferably, water is added to increase the production of 1,1,1,3,3- pentachloropropane by the reaction of carbon tetrachloride and vinyl chloride in the presence of a catalyst mixture of organo phosphate solvent, iron metal and ferric chloride.



WO 02/102750 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/18253

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07C19/01 C07C17/278 C07C17/272

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, BEILSTEIN Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01 25176 A (SOLVAY SOCIÉTÉ ANONYME) 12 April 2001 (2001-04-12) the whole document, particularly page 2, lines 3-12 ---	1-12
X	US 2 658 930 A (THOMPSON R B) 10 November 1953 (1953-11-10) the whole document ---	8, 11, 12
A	WO 97 07083 A (ALLIEDSIGNAL INC.) 27 February 1997 (1997-02-27) the whole document ---	1, 8
A	EP 0 131 561 A (MONSANTO COMPANY) 16 January 1985 (1985-01-16) cited in the application the whole document, particularly page 19, lines 1-9 -----	1, 8



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

20 December 2002

Date of mailing of the international search report

07/01/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Allard, M

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/18253

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 8-12 (all in part)
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 8-12 (all in part)

Present claims 8-12 relate to a process for preparing an extremely large number of possible compounds. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for the preparation of only one compound. In the present case, claims 8-12 so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, a complete search has only been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the preparation of 1,1,1,1,3,3-pentachloropropane.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/18253

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0125176	A	12-04-2001	EP 1090897 A1 11-04-2001
		AU 7784500 A 10-05-2001	
		WO 0125176 A1 12-04-2001	
		EP 1222154 A1 17-07-2002	
		US 6369285 B1 09-04-2002	
US 2658930	A	10-11-1953	NONE
WO 9707083	A	27-02-1997	US 5902914 A 11-05-1999
		AT 196457 T 15-10-2000	
		AU 6602496 A 12-03-1997	
		CA 2229200 A1 27-02-1997	
		CN 1199387 A 18-11-1998	
		DE 69610433 D1 26-10-2000	
		DE 69610433 T2 18-01-2001	
		EP 0850210 A1 01-07-1998	
		ES 2150686 T3 01-12-2000	
		JP 11511164 T 28-09-1999	
		WO 9707083 A1 27-02-1997	
EP 131561	A	16-01-1985	AT 22877 T 15-11-1986
		AU 3031784 A 10-01-1985	
		DE 3460965 D1 20-11-1986	
		DK 329884 A 07-01-1985	
		EP 0131561 A1 16-01-1985	
		HU 34421 A2 28-03-1985	
		JP 60036428 A 25-02-1985	
		ZA 8405182 A 27-03-1985	