

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
26 June 2008 (26.06.2008)

PCT

(10) International Publication Number
WO 2008/076272 A3

(51) International Patent Classification:
C09K 5/04 (2006.01) **C09K 3/30** (2006.01)
C08J 9/14 (2006.01) **A62D 1/00** (2006.01)

(21) International Application Number:
PCT/US2007/025383

(22) International Filing Date:
12 December 2007 (12.12.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/875,077 15 December 2006 (15.12.2006) US

(71) Applicant (for all designated States except US): **E. I. DU PONT DE NEMOURS AND COMPANY** [US/US]; 1007 Market Street, Wilmington, Delaware 19898 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **NAPPA, Mario, Joseph** [US/US]; 3 Oakridge Court, Newark, Delaware 19711 (US). **MINOR, Barbara, Haviland** [US/US]; 233 Greenhaven Drive, Elkton, Maryland 21921 (US). **NOELKE, Charles, Joseph** [US/US]; 189 Hunter Trail, Southern Pines, North Carolina 28387 (US).

(74) Agent: **HAMBY, Jane, O.**; E. I. du Pont de Nemours and Company, Legal Patent Records Center, 4417 Lancaster Pike, Wilmington, Delaware 19805 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, **BR**, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, **HR**, HU, **ID**, IL, IN, IS, **JP**, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
14 August 2008

(54) Title: COMPOSITIONS COMPRISING 1,2,3,3,3-PENTAFLUOROPROPENE WITH Z- AND E-ISOMER RATIO OPTIMIZED FOR REFRIGERATION PERFORMANCE

(57) Abstract: Azeotropic or near- azeotropic compositions are disclosed comprising about 0.1 weight percent to about 99.9 weight percent Z-1,2,3,3,3-pentafluoropropene (Z-1225ye) and about 99.9 weight percent to about 0.1 weight percent E"-1,2,3,3,3-pentafluoropropene (E"-1225ye). Also disclosed is a method for increasing refrigeration capacity for 1,2,3,3,3-pentafluoropropene (HFC-1225ye) said method comprising increasing the amount of Z-isomer (Z-1225ye) relative to the amount of E"-isomer (E"-1225ye).



WO 2008/076272 A3

INTERNATIONAL SEARCH REPORT

international application No

PCT/US2007/025383

A. CLASSIFICATION OF SUBJECT MATTER
 INV. C09K5/04 C08J9/14 C09K3/30 A62D1/00

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)
 C09K A62D C08J

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, 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	US 2004/127383 A1 (PHAM HANG T [US] ET AL) 1 July 2004 (2004-07-01) paragraphs [0006], [0016], [0017] paragraphs [0024], [0032] claims 1,13,15,23,24,34,36,44,45,51,57 claims 59-72 -----	1,5-7, 10-18
A	US 6 031 141 A (MALLIKARJUNA RAO V N [US] ET AL) 29 February 2000 (2000-02-29) column 2, lines 53-56 example 3 -----	1,5
P, X	WO 2007/053178 A (DU PONT [US]; MILLER RALPH NEWTON [US]; NAPPA MARIO JOSEPH [US]; RAO V) 10 May 2007 (2007-05-10) example 3; table 5 ----- -/-	1,5



Further documents are listed in the continuation of Box C



See patent family 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

"&" document member of the same patent family

Date of the actual completion of the international search

18 June 2008

Date of mailing of the international search report

30/06/2003

Name and mailing address of the ISA/

European Patent Office, P B E818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel (+31-70) 340-2040 Tx 31 651 epo nl
 Fax (+31-70) 340-3016

Authorized officer

Puetz, Christine

INTERNATIONAL SEARCH REPORT

international application No
PCT/US2007/025383

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
E	<p>WO 2008/030439 A (DU PONT [US]; RAO VELLIYUR NOTT MALLIKARJUNA [US]; SIEVERT ALLEN CAPRO) 13 March 2008 (2008-03-13) examples 1,2</p> <p>-----</p>	1, 5, 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/025383

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004127383 A1	01-07-2004	NONE	
us 6031141 A	29-02-2000	NONE	
WO 2007053178 A	10-05-2007	AR 056970 A1	07-11-2007
WO 2008030439 A	13-03-2008	NONE	