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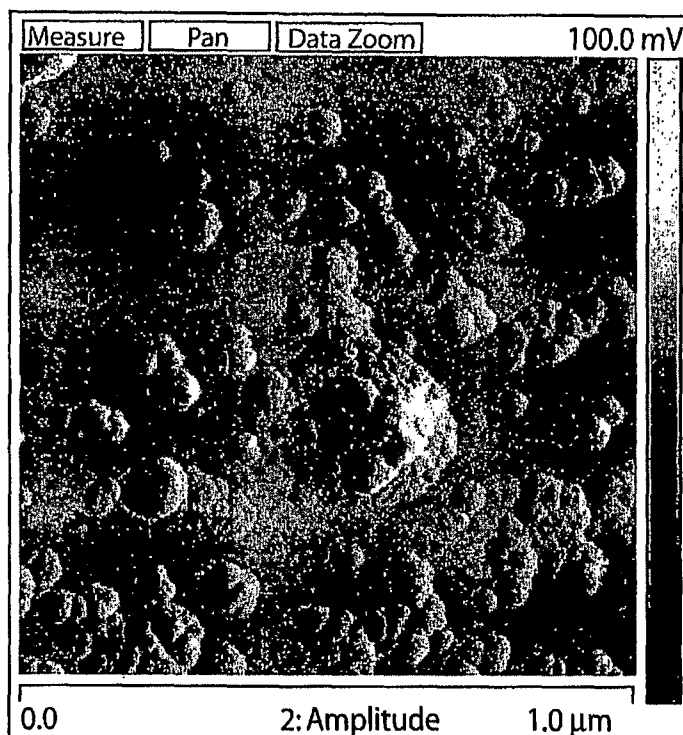
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(54) Title: SMALL PARTICLE COMPOSITIONS AND ASSOCIATED METHODS



(57) Abstract: Small particle compositions are provided. The particles may have one or more desired features related to particle morphology, topology and crystallographic orientation. The small particle size coupled with such feature(s) can lead to significant property advantages in a variety of different applications including catalytic applications.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER INV. C09C1/36 C01G23/047 C09C1/40 C01F7/02		
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/155455 A1 (DOBBS ROBERT [US]) 21 July 2005 (2005-07-21) paragraphs [0010], [0046], [0047], [0066], [0080], [0148]	1-32
X	US 2002/047058 A1 (VERHOFF FRANK [US] ET AL) 25 April 2002 (2002-04-25) paragraphs [0076], [0100], [0105], [0106] table 1	1-9, 22-26, 29, 31
X	DE 197 58 384 A1 (GEESTHACHT GKSS FORSCHUNG [DE]; GFE MET & MAT GMBH [DE]; HYDRO QUEBEC) 1 July 1999 (1999-07-01) examples 1,5 figures 1,7	22-28, 31, 33
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Date of the actual completion of the international search <div style="text-align: center; font-size: 1.2em;">23 April 2008</div>	Date of mailing of the international search report <div style="text-align: center; font-size: 1.2em;">07/05/2008</div>	
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International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/110699 A (PRIMET PREC MATERIALS INC [US]) 23 December 2004 (2004-12-23) paragraphs [0042] - [0047], [0061] - [0076], [0081], [0082] -----	1-32
X	US 5 704 556 A (MCLAUGHLIN JOHN R [US]) 6 January 1998 (1998-01-06) example 5 A column 6, line 31 - line 44 -----	8, 17, 26, 32 1-7, 9-16, 18-25, 27-31
X	FR 2 677 012 A (RHONE POULENC CHIMIE [FR]) 4 December 1992 (1992-12-04) page 1, line 4 - line 12 page 1, line 36 - page 3, line 13 -----	1, 2, 4, 7-9, 11-13, 22, 23, 25-27
X	US 5 225 390 A (VOGEL DORIS [DE] ET AL) 6 July 1993 (1993-07-06) columns 2, 4 -----	4, 7-9, 11-13, 16-18, 21-23, 25-27
E	WO 2007/016308 A (PRIMET PREC MATERIALS INC [US]; DOBBS ROBERT J [US]) 8 February 2007 (2007-02-08) cited in the application page 2, line 11 - page 4, line 10 page 7, line 12 - line 29 page 18, line 1 - page 20, line 31 -----	1-33
E	WO 2007/016528 A (PRIMET PREC MATERIALS INC [US]; DOBBS ROBERT J [US]; DOLHERT LEONARD E) 8 February 2007 (2007-02-08) page 3, line 13 - line 18 page 5, line 22 - line 30 page 11, line 16 - line 24 -----	1-33

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/042182

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005155455	A1	21-07-2005	US 2005200035 A1 15-09-2005
			US 2005158227 A1 21-07-2005
			US 2005158228 A1 21-07-2005
			US 2005159494 A1 21-07-2005
			US 2005158229 A1 21-07-2005
			US 2005158230 A1 21-07-2005
			US 2005158231 A1 21-07-2005
			US 2005158232 A1 21-07-2005
			US 2005158233 A1 21-07-2005
			US 2005158234 A1 21-07-2005
			US 2005161540 A1 28-07-2005
			US 2006003013 A1 05-01-2006
			US 7140567 B1 28-11-2006
US 2002047058	A1	25-04-2002	NONE
DE 19758384	A1	01-07-1999	CA 2316289 A1 08-07-1999
			WO 9933747 A1 08-07-1999
			EP 1042218 A1 11-10-2000
			JP 3824052 B2 20-09-2006
			JP 2001527017 T 25-12-2001
			US 6387152 B1 14-05-2002
WO 2004110699	A	23-12-2004	AU 2004247623 A1 23-12-2004
			BR PI0408278 A 07-03-2006
			CA 2518851 A1 23-12-2004
			CN 1795145 A 28-06-2006
			EP 1615746 A2 18-01-2006
			JP 2006528550 T 21-12-2006
			KR 20050120758 A 23-12-2005
			MX PA05009610 A 31-05-2006
US 5704556	A	06-01-1998	NONE
FR 2677012	A	04-12-1992	NONE
US 5225390	A	06-07-1993	NONE
WO 2007016308	A	08-02-2007	AU 2006275742 A1 08-02-2007
WO 2007016528	A	08-02-2007	NONE