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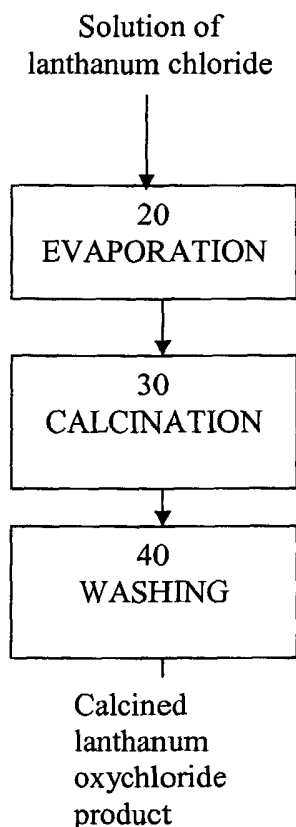
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- (71) Applicant: **ALTAIR NANOMATERIALS INC.** (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), [US/US]; 204 Edison Way, Reno, NV 89502 (US).

[Continued on next page]

(54) Title: RARE EARTH METAL COMPOUNDS, METHODS OF MAKING, AND METHODS OF USING THE SAME



(57) Abstract: Rare earth metal compounds, particularly lanthanum, cerium, and yttrium, are formed as porous particles and are effective in binding metals, metal ions, and phosphate. A method of making the particles and a method of using the particles is disclosed. The particles may be used in the gastrointestinal tract or the bloodstream to remove phosphate or to treat hyperphosphatemia in mammals. The particles may also be used to remove metals from fluids such as water.

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Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/25192

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C01F17/00 C09C1/36 A61K33/24 C02F1/52

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 C01F C09C A61K C02F

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, PAJ, 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 02/22258 A (UNION CARBIDE CHEM PLASTIC) 21 March 2002 (2002-03-21) page 15, line 14 - page 16, line 2; claims 22-24	1-5, 7-12, 17-20, 25
X	US 4 929 787 A (MIMOUN HUBERT ET AL) 29 May 1990 (1990-05-29) column 2, line 8 - line 49	1-5, 7-12, 17-20, 25
X	US 3 922 331 A (MACDONALD DAVID J ET AL) 25 November 1975 (1975-11-25) the whole document	1-5, 7-12, 17-20

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

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- * & * document member of the same patent family

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INTERNATIONAL SEARCH REPORT

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	US 4 462 970 A (GORRE LUISA E ET AL) 31 July 1984 (1984-07-31) claims; example 7 -----	1-3
A	US 3 692 671 A (GHASSEMI MASOOD ET AL) 19 September 1972 (1972-09-19) column 4, line 24 - line 27; claim 4 -----	22,36
A	GRAFF L ET AL: "A POSSIBLE NON-ALUMINUM ORAL PHOSPHATE BINDER? ÆA COMPARATIVE STUDY ON DIETARY PHOSPHORUS ABSORPTION" RESEARCH COMMUNICATIONS IN CHEMICAL PATHOLOGY AND PHARMACOLOGY, PJD PUBLICATIONS LTD., WESTBURY, NY, US, vol. 89, no. 3, 1 September 1995 (1995-09-01), pages 373-388, XP000578701 ISSN: 0034-5164 the whole document -----	1-24
A	US 6 146 539 A (MILLS DUDLEY JOHN) 14 November 2000 (2000-11-14) -----	1-24
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A	DATABASE CHEMABS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; OLAFSEN, ANJA ET AL: "Synthesis of rare earth oxide carbonates and thermal stability of Nd ₂ O ₂ CO ₃ II" XP002280167 retrieved from STN Database accession no. 132:18170 abstract & JOURNAL OF MATERIALS CHEMISTRY , 9(10), 2697-2702 CODEN: JMACEP; ISSN: 0959-9428, 1999, -----	23-26
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INTERNATIONAL SEARCH REPORT

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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.
A	& THERMOCHIMICA ACTA , 190(2), 335-43 CODEN: THACAS; ISSN: 0040-6031, 1991, ----- DATABASE CHEMABS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; YAMAGUCHI, O. ET AL: "Formation and decomposition of lanthanum monoxocarbonate" XP002280169 retrieved from STN Database accession no. 101:203165 abstract & ZEITSCHRIFT FUER ANORGANISCHE UND ALLGEMEINE CHEMIE , 514, 205-12 CODEN: ZAACAB; ISSN: 0044-2313, 1984, -----	23-26
A	DATABASE WPI Section Ch, Week 199612 Derwent Publications Ltd., London, GB; Class D15, AN 1996-110856 XP002280114 & JP 08 010610 A (ISHIHARA SANGYO KAISHA LTD) 16 January 1996 (1996-01-16) abstract -----	27-35
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/25192

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.:
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:

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:

see additional sheet

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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-22,36

Rare earth metal oxycarbonates and oxychlorides with high porosity, a device containig such a compound, lanthanum oxycarbonate with a large specific surface and a method for reducing the metal content of a fluid making use of such compounds

2. claims: 23-26

Method for making lanthanum oxycarbonates of oxychlorides

3. claims: 27-35

Titania coated with a rare earth compound and method for the preparation of a composition comprising titania and a rare earth compound

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/25192

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International Application No

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