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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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[Continued on next page]

(54) Title: HETEROLEPTIC (ALLYL)(PYRROLES-2-ALDIMINATE) METAL-CONTAINING PRECURSORS, THEIR SYNTHESIS AND VAPOR DEPOSITION THEREOF TO DEPOSIT METAL-CONTAINING FILMS

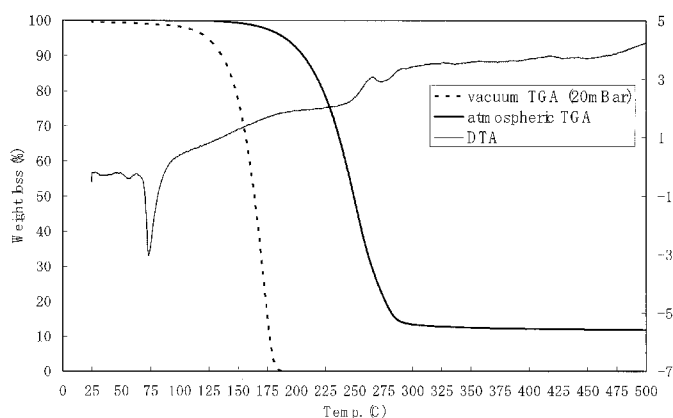
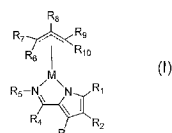


FIG 5 Atmospheric and vacuum TGA of allyl 2-isopropyliminomethylpyrrolyl nickel(II).

(57) Abstract: Disclosed are metal-containing precursors having the formula Compound (I) wherein: - M is a metal selected from Ni, Co, Mn, Pd; and - each of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub>, and R<sub>10</sub> are independently selected from H; a C1-C4 linear, branched, or cyclic alkyl group; a C1-C4 linear, branched, or cyclic alkylsilyl group (mono, bis, or tris alkyl); a C1-C4 linear, branched, or cyclic alkylamino group; or a C1-C4 linear, branched, or cyclic fluoroalkyl group. Also disclosed are methods of synthesizing and using the disclosed metal-containing precursors to deposit metal-containing films on a substrate via a vapor deposition process.



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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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**A. CLASSIFICATION OF SUBJECT MATTER***C07F 15/06(2006.01)i, C07F 15/04(2006.01)i, C07F 15/00(2006.01)i, C07B 61/00(2006.01)i*

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)

C07F 15/06; B05D 5/12; C22C 5/04; C23C 16/00

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) &amp; Keywords: allyl pyrrole, aldiminate, cvd, ald, metal, deposotoin.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	P. Perez-Puente et al. Journal of Organometallic Chemistry 693 (2008) 3902-3906 See scheme 1.	1-12
A	US 2010-0119406 A1 (DUSSARRAT CHRISTIAN et al.) 13 May 2010 See pages 4-5.	1-12
A	US 05403620 A (KAESZ; HERBERT D. et al.) 04 April 1995 See columns 7-8.	1-12
A	US 2005-0220998 A1 (MEI CHANG et al.) 06 October 2005 See claims 1, 12 and 13.	1-12



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

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"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

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"&amp;" document member of the same patent family

Date of the actual completion of the international search

23 JANUARY 2013 (23.01.2013)

Date of mailing of the international search report

**24 JANUARY 2013 (24.01.2013)**

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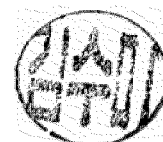
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/044950**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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