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(71) Applicant (for all designated States except US): **UNIVERSITY OF KANSAS** [US/US]; 2385 Irving Hill Road, Lawrence, KS 66045-7563 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SUBRAMANIAM, Bala** [US/US]; 1613 Troon Lane, Lawrence, KS 66047 (US). **ROY, Debdut, S.** [IN/US]; 1528 Eddingham Dr., Lawrence, KS 66046 (US). **CHAUDHARI, Raghunath, V.** [IN/US]; 6109 Palisades Dr., Lawrence, KS 66049 (US).

(74) Agents: **REED, Carl, T.** et al.; Workman Nydegger, 1000 Eagle Gate Tower, 60 East South Temple, Salt Lake City, UT 84111 (US).

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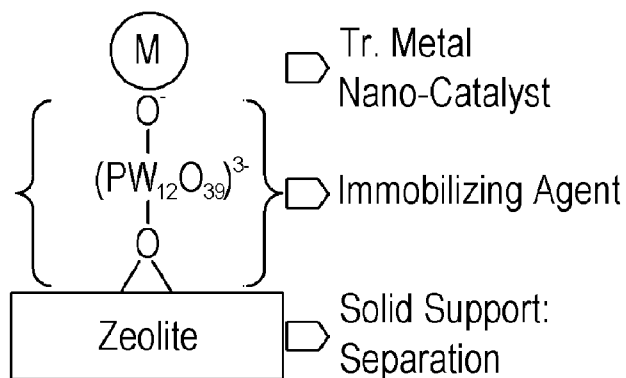
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[Continued on next page]

(54) Title: NANO-METAL CATALYSTS FOR POLYOL HYDROGENOLYSIS

**Fig. 4**

(57) Abstract: A catalyst composition can include: a support; a ruthenium catalyst (Ru) nanoparticle; and a linker linking the Ru nanoparticle to the support, wherein the linker is stable under hydrogenolysis conditions. In one aspect, the linker can include 3-aminopropyl trimethoxysilane (APTS) or derivatives thereof, such as those with amine functionality. In another aspect, the linker can include phosphotungstic acid (PTA) or other similar solid acid agents. In another aspect, the support can be selected from alumina, carbon, silica, a zeolite, TiO₂, ZrO₂, or another suitable material. A specific example of a support includes zeolite, such as a NaY zeolite. The Ru nanoparticle can have a size range from about 1 nm to about 25 nm. and can be obtained by reduction of Ru salts.



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A. CLASSIFICATION OF SUBJECT MATTER***B01J 23/46(2006.01)i, B01J 29/12(2006.01)i, B01J 37/02(2006.01)i, C07C 29/157(2006.01)i, C07C 29/128(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)

B01J 23/46; B01J 21/18; B01J 21/08; C07C 29/132; C07C 29/14; B01J 21/04; B01J 21/00; C07C 31/18

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) & Keywords: catalyst, ruthenium, support, nanoparticle, linker, hydrogenolysis

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4503274 A1 (BLAISE J. ARENA) 05 March 1985 See abstract, examples 1-3, claims 1-2	1-30
A	US 3963788 A1 (WALTER M. KRUSE et al.) 15 June 1976 See abstract, examples 1-12, claim 1	1-30
A	US 5403805 A1 (GIUSEPPE GUBITOSA et al.) 04 April 1995 See abstract, claims 1, 5, 7	1-30
A	US 5354914 A1 (GIUSEPPE GUBITOSA et al.) 11 October 1994 See abstract, claim 1	1-30
A	US 2007-0135301 A1 (DALE E. HOLCOMB JR.) 14 June 2007 See abstract, claim 1	1-30
A	US 4273680 A1 (ALBERT P. HALLUIN et al.) 16 June 1981 See abstract, claims 1, 16	1-30



Further documents are listed in the continuation of Box C.



See patent family annex.

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Authorized officer

LEE, Young Wan

Telephone No. 82-42-481-5560



INTERNATIONAL SEARCH REPORT

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