(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 184 172 B8**

(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

(15) Correction information:
Corrected version no 1 (W1 B1)
Corrections, see
Bibliography INID code(s) 84

(48) Corrigendum issued on:
16.10.2024 Bulletin 2024/42

(45) Date of publication and mention of the grant of the patent:
04.09.2024 Bulletin 2024/36

(21) Application number: **15833178.5**

(22) Date of filing: **19.08.2015**

(51) International Patent Classification (IPC):
B01J 31/22 *(2006.01)* ***B01J 31/18*** *(2006.01)*
C07F 7/18 *(2006.01)* ***C07B 61/00*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B01J 31/18; B01J 31/181; B01J 31/1815; B01J 31/22; B01J 31/2273; B01J 31/2291; B01J 31/2295; C07F 7/18; B01J 2231/323; B01J 2531/842; C07B 61/00

(86) International application number:
PCT/JP2015/073185

(87) International publication number:
WO 2016/027819 (25.02.2016 Gazette 2016/08)

(54) HYDROSILYLATION IRON CATALYST

HYDROSILYLIERUNGSEISENKATALYSATOR

CATALYSEUR AU FER D'HYDROSILYLATION

(84) Designated Contracting States:
DE FR GB

(30) Priority: **19.08.2014 JP 2014166596**

(43) Date of publication of application:
28.06.2017 Bulletin 2017/26

(73) Proprietors:
- **Kyushu University,**
  National University Corporation
  Fukuoka-shi, Fukuoka 812-8581 (JP)
- **Shin-Etsu Chemical Co., Ltd.**
  Tokyo 100-0004 (JP)

(72) Inventors:
- **NAGASHIMA Hideo**
  Fukuoka-shi
  Fukuoka 812-8581 (JP)
- **SUNADA Yusuke**
  Fukuoka-shi
  Fukuoka 812-8581 (JP)
- **NODA Daisuke**
  Fukuoka-shi
  Fukuoka 812-8581 (JP)
- **SOEJIMA Hiroe**
  Fukuoka-shi
  Fukuoka 812-8581 (JP)
- **SAKUTA Koji**
  Annaka-shi
  Gunma 379-0224 (JP)

(74) Representative: **Mewburn Ellis LLP**
Aurora Building
Counterslip
Bristol BS1 6BX (GB)

(56) References cited:
EP-A1- 3 269 724
JP-A- 2012 532 884
JP-A- 2012 532 885
US-A1- 2011 009 565
US-A1- 2011 009 573

- **YUSUKE SUNADA ET AL: "Catalyst design for iron-promoted reductions: an iron disilyl-dicarbonyl complex bearing weakly coordinating eta2-(H-Si) moieties", DALTON TRANSACTIONS: THE INTERNATIONAL JOURNAL FOR INORGANIC, ORGANOMETALLIC AND BIOINORGANIC CHEMISTRY, vol. 42, no. 48, 1 January 2013 (2013-01-01), GB, pages 16687, XP055274101, ISSN: 1477-9226, DOI: 10.1039/c3dt52598h**

Processed by Luminess, 75001 PARIS (FR)

(Cont. next page)

- DAISUKE NODA ET AL: "Effect of TMEDA on Iron-Catalyzed Coupling Reactions of ArMgX with Alkyl Halides", JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 131, no. 17, 6 May 2009 (2009-05-06), US, pages 6078 - 6079, XP055446593, ISSN: 0002-7863, DOI: 10.1021/ja901262g
- YUSUKE SUNADA ET AL: "Combinatorial Approach to the Catalytic Hydrosilylation of Styrene Derivatives: Catalyst Systems Composed of Organoiron(0) or (II) Precursors and Isocyanides", ORGANOMETALLICS, vol. 34, no. 12, 22 June 2015 (2015-06-22), US, pages 2896 - 2906, XP055348163, ISSN: 0276-7333, DOI: 10.1021/acs.organomet.5b00201
- RUSSELL SARAH K. ET AL: "Synthesis, electronic structure and reactivity of bis(imino)pyridine iron carbene complexes: evidence for a carbene radical", CHEMICAL SCIENCE, vol. 5, no. 3, 1 January 2014 (2014-01-01), United Kingdom, pages 1168 - 1174, XP055963607, ISSN: 2041-6520, DOI: 10.1039/C3SC52450G
- S. C. BART ET AL.: "Preparation and Molecular and Electronic Structures of Iron (0) Dinitrogen and Silane Complexes and Their Application to Catalytic Hydrogenation and Hydrosilation", JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 126, no. 42, 27 October 2004 (2004-10-27), pages 13794 - 13807, XP055131295, DOI: doi:10.1021/ja046753t
- A. M. TONDREAU ET AL.: "Enantiopure Pyridine Bis(oxazoline) ''Pybox'' and Bis(oxazoline) ''Box'' Iron Dialkyl Complexes: Comparison to Bis(imino)pyridine Compounds and Application to Catalytic Hydrosilylation of Ketones", ORGANOMETALLICS, vol. 28, no. 13, 13 July 2009 (2009-07-13), pages 3928 - 3940, XP055131292, DOI: doi:10.1021/om900224e
- T. HASHIMOTO ET AL.: "Synthesis of Bis(N-heterocyclic carbene) Complexes of Iron(II) and Their Application in Hydrosilylation and Transfer Hydrogenation", ORGANOMETALLICS, vol. 31, no. 12, 25 June 2012 (2012-06-25), pages 4474 - 4479, XP055406792
- E. BUITRAGO ET AL.: "Selective hydrosilylation of ketones catalyzed by in situ-generated iron NHC complexes", APPLIED ORGANOMETALLIC CHEMISTRY, vol. 25, no. 10, October 2011 (2011-10-01), pages 748 - 752, XP055406793