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(54) Title: APPARATUS AND METHOD FOR THE CONDENSED PHASE PRODUCTION OF TRISILYLAMINE

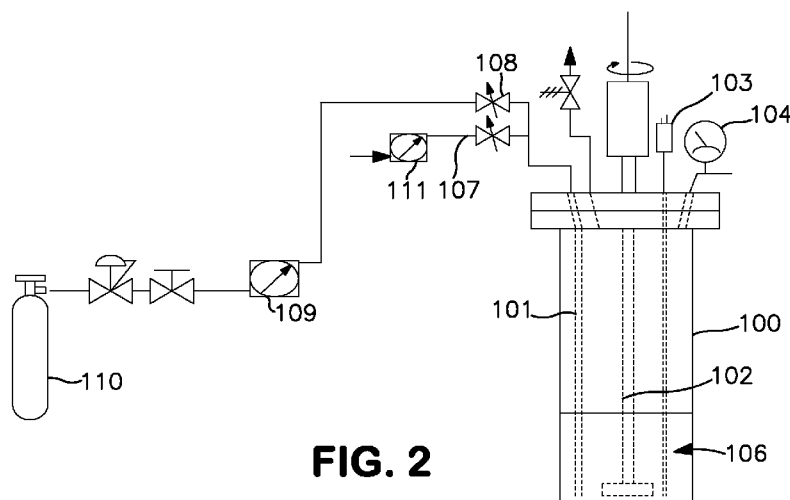


FIG. 2

(57) Abstract: The present invention is directed to a condensed phase batch process for synthesis of trisilylamine (TSA). An improved synthesis method that incorporates a solvent to help promote a condensed-phase reaction between ammonia gas (or liquid) and liquified monochlorosilane (MCS) in good yields is described. This method facilitates the removal of the byproduct waste with little to no reactor down time, substantial reduction of down-stream solids contamination and high-purity product from first-pass distillation.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/058764**A. CLASSIFICATION OF SUBJECT MATTER****COIB 21/068(2006.01)i, B01J 8/00(2006.01)1, B01J 19/18(2006.01)1**

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)

COIB 21/068; COIB 33/00; H01L 21/30; B01J 3/00; C23C 16/30

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: trisilylamine, solvent, monohalosilane, monochlorosilane, ammonia, anisole.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2011-0136347 A1 (KOVARSKY, N. Y. et al.) 09 June 2011 See paragraphs [0016H0021], [0025]; figure 1; claims 1, 4, 9, 13.	1-18
A	US 2010-0310443 A1 (MILLER, G. D.) 09 December 2010 See claims 1 & 4-8.	1-18
A	Well, R. L. et al., "Studies of Silicon-Nitrogen Compounds. The Base-Catalyzed Elimination of Silane from Trisilylamine", J. Am. Chem. Soc. 1966, Vol. 88, pages 37-42. See pages 37-38.	1-18
A	FESSENDEN, R. et al., "The Chemistry of Silicon-Nitrogen Compounds", Chem. Rev. 1961, Vol. 66, pages 361-388. See page 363.	1-18

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"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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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011-0136347 A 1	09.06.2011	TW 201120236 A W0 2011-049811 A2 W0 2011-049811 A3	16.06.2011 28.04.2011 14.07.2011
US 2010-0310443 A 1	09.12.2010	CN 102458643 A EP 2437880 A 1 KR 10-2012-0046148 A TW 201105573 A W0 2010-141551 A 1	16.05.2012 11.04.2012 09.05.2012 16.02.2011 09.12.2010