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(54) Title: A PROCESS FOR THE PRODUCTION OF NITROGEN OR PHOSPHORUS CONTAINING COMPOUNDS FROM SYNTHESIS GAS

(57) Abstract: A process is described for the production of one or more of linear nitriles, amides and formamides which includes reacting a nitrogen containing compound, such as ammonia or NO<sub>x</sub>, and a synthesis gas over a catalyst at a temperature of between 160 °C and 400°C and a pressure of between 1 bar and 50 bar. A further process for the production of one or more of linear phosphorous containing compounds is also described, which includes reacting a phosphorous containing compound, such as a phosphine, and a synthesis gas over a catalyst at a temperature of between 160 °C and 400°C and a pressure of between 1 bar and 50 bar. A supported cobalt, iron, ruthenium or rhodium catalyst or an unsupported (bulk) promoted iron catalyst, modified with a promoter is used. The synthesis gas is a mixture of hydrogen and carbon monoxide, in a ratio from 0.5:1 to 5:1; or a mixture of hydrogen and carbon dioxide; or a mixture of water and carbon monoxide. The suppression of the formation of oxygenates in the process is a feature of the invention and oxygenates may even be included in the feed to become converted to corresponding nitrogen containing compounds in the process.



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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB 2009/005242

## A. CLASSIFICATION OF SUBJECT MATTER

IPC<sup>8</sup>: **C07C 253/00** (2006.01); **C07C 231/10** (2006.01); **C07C 1/04** (2006.01);  
**C07F 9/02** (2006.01)

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<sup>8</sup>: C07C, C07F

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

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

WPI, EPODOC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 441 234 B1 ( DAHLHAUS et al.) 27 August 2002 (27.08.2002) <i>Claims; examples</i> --	1-11,14,15
X	US 4 556 734 A (KNIFTON) 03 December 1985 (03.12.1985) <i>Claims; examples</i> --	1-11,14,15
X	US 4 558 157 A (MARSELLA et al.) 10 December 1985 (10.12.1985) <i>Claims; examples</i> ----	1-11,14,15

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

\* Special categories of cited documents:

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"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

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31 March 2010 (31.03.2010)Date of mailing of the international search report  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report			Publication date		Patent family member(s)	Publication date
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					KR A 20010101548	2001-11-14
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