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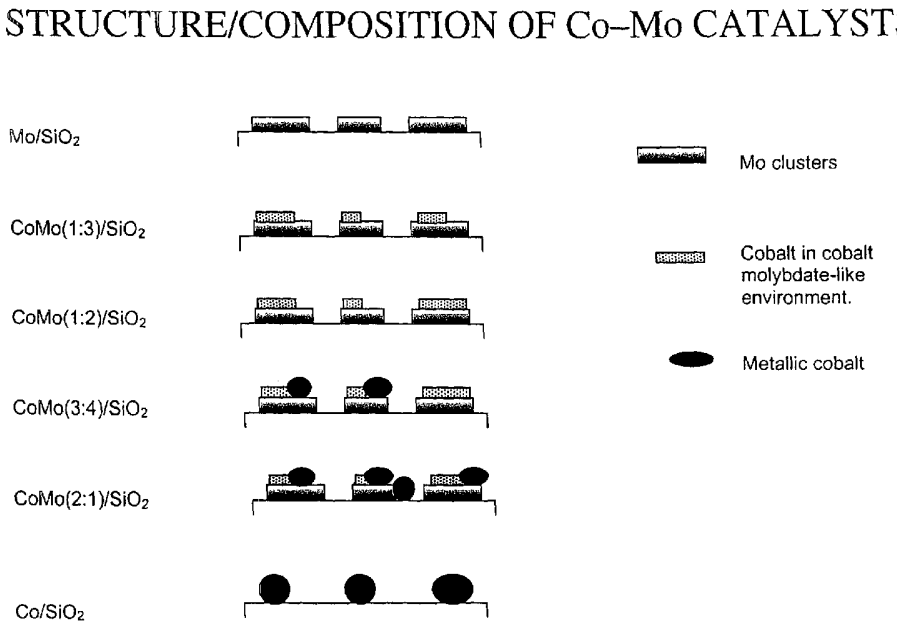
[Continued on next page]

(54) Title: METHOD AND CATALYST FOR PRODUCING CARBON NANOTUBES



(57) Abstract: A catalyst composition and method of use of the catalyst composition for producing single-walled carbon nanotubes (SWNTs). The catalyst is cobalt (Co) and molybdenum (Mo) on a silica support. The Mo occurs primarily as dispersed Mo oxide clusters on the support while the Co is primarily in an octahedral configuration in a CoMoO4-like phase disposed on the Mo oxide clusters. In the method, the catalyst is used and the process conditions manipulated in such a manner as to enable the diameters of the SWNTs to be substantially controlled.

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INTERNATIONAL SEARCH REPORT

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PCT/US 02/23155

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C01B31/02 B01J23/882

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 7 C01B B01J

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

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

EPO-Internal, COMPENDEX, INSPEC, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ALVAREZ W E ET AL: "Synergism of Co and Mo in the catalytic production of single-wall carbon nanotubes by decomposition of CO" CARBON, vol. 39, no. 4, April 2001 (2001-04), pages 547-558, XP004319871 ISSN: 0008-6223 the whole document ---	1-25
X	WO 00 73205 A (HARWELL JEFFREY H ;UNIV OKLAHOMA STATE (US); ALVAREZ WALTER (US);) 7 December 2000 (2000-12-07) cited in the application examples 1,5,9 ---	1-25
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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

"E" earlier document but published on or after the international filing date

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Date of the actual completion of the international search	Date of mailing of the international search report
3 July 2003	21/07/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Marucci, A

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PCT/US 02/23155

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	DE BOER M ET AL: "Cobalt-molybdenum interaction in CoMo/SiO2 catalysts: a CO-oxidation study" PROCEEDINGS OF THE 12TH INTERNATIONAL SYMPOSIUM ON REACTIVITY OF SOLIDS;MADRID, SPAIN SEP 24-30 1992, vol. 63-65, 24 September 1992 (1992-09-24), pages 736-742, XP009013242 Solid State Ionics;Solid State Ionics Sep 1993 "Results and discussion" figure 3; table 2 ---	1-3,22
X	KITIYANAN B. ET AL: "Controlled production of single-wall carbon nanotubes by catalytic decomposition of CO on bimetallic Co-Mo catalysts" CHEMICAL PHYSICS LETTERS, vol. 317, 4 February 2000 (2000-02-04), pages 497-503, XP002149234 the whole document ---	1-25
A	BANDOW S. ET AL: "Effect of the growth temperature on the diameter distribution and chirality of single-wall carbon nanotubes" PHYSICAL REVIEW LETTERS, vol. 80, no. 17, 27 April 1998 (1998-04-27), pages 3779-3782, XP002246341 figure 2 ---	4,10,16
A	DATABASE COMPENDEX 'Online! ENGINEERING INFORMATION, INC., NEW YORK, NY, US; CHATURVEDI S ET AL: "Properties of pure and sulfided NiMoO4 and CoMoO4 catalysts: TPR, XANES and time-resolved XRD studies" Database accession no. EIX99044490981 XP002246342 abstract & PROCEEDINGS OF THE 1997 MRS FALL SYMPOSIUM;BOSTON, MA, USA DEC 2-4 1997, vol. 497, 2 December 1997 (1997-12-02), pages 41-46, Mater Res Soc Symp Proc;Materials Research Society Symposium - Proceedings; Recent Advances in Catalytic Materials 1998 MRS, Warrendale, PA, USA -----	1,4,10, 16

INTERNATIONAL SEARCH REPORT

Information on patent family members

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