

Title (en)
SURFACE CATALYST INFRA RED LASER

Title (de)
INFRAROT LASER MIT OBERFLÄCHENKATALYSATOR

Title (fr)
LASER INFRAROUGE A CATALYSEUR DE SURFACE

Publication
EP 1232546 A4 20030102 (EN)

Application
EP 00976599 A 20001019

Priority
• US 0028930 W 20001019
• US 16052799 P 19991020

Abstract (en)
[origin: WO0129938A1] A process and apparatus are provided for the generation of laser radiation by providing a fuel (105), such as methanol, ethanol, carbon monoxide and/or hydrogen, and air (106) to a catalyst (102), such as platinum, which is located beneath a polychromatic resonant optical cavity formed by laser mirrors (107) and (108). The catalyst surface is flooded with adsorbed fuel radicals, leaving relatively few sites for oxygen adsorption. Under this condition, the oxygen dissociates into two oxygen atoms or free radicals with approximately one electron volt of energy (i.e. "hot atoms"). These "hot atoms" of oxygen find fuel radicals as collision partners and form reaction products that are in their highest vibrational state. A vibrationally inverted population is a prerequisite of stimulated emission of radiation.

IPC 1-7
H01S 3/00; **H01S 3/14**; **H01S 3/22**; **H01S 3/223**

IPC 8 full level
H01S 3/09 (2006.01); **H01S 3/0953** (2006.01); **H01S 3/22** (2006.01); **H01S 3/223** (2006.01)

CPC (source: EP KR)
H01S 3/0953 (2013.01 - EP); **H01S 5/30** (2013.01 - KR); **H01S 3/22** (2013.01 - EP); **H01S 3/223** (2013.01 - EP)

Citation (search report)
• [XAY] US 3694770 A 19720926 - BURWELL WAYNE G, et al
• [Y] DE 1230509 B 19661215 - PHILIPS NV
• [E] WO 0072384 A1 20001130 - NEOKISMET LLC [US]
• [E] WO 0128677 A1 20010426 - NEOKISMET LLC [US]
• [XPXY] US 6114620 A 20000905 - ZUPPERO ANTHONY C [US], et al
• [XY] NOLAN P D ET AL: "MOLECULARLY CHEMISORBED INTERMEDIATES TO OXYGEN ADSORPTION ON PT(111): A MOLECULAR BEAM AND ELECTRON ENERGY-LOSS SPECTROSCOPY STUDY", JOURNAL OF CHEMICAL PHYSICS, NEW YORK, NY, US, vol. 111, no. 8, 22 August 1999 (1999-08-22), pages 3696 - 3704, XP002936468, ISSN: 0021-9606
• [X] BONN M ET AL: "Phonon- versus electron-mediated desorption and oxidation of CO on Ru(0001)", SCIENCE, vol. 285, - 22 August 1999 (1999-08-22), pages 1042 - 1045, XP002219124
• [YA] AVOURIS P ET AL: "Electron-Stimulated Catalysis Device", IBM TECHNICAL DISCLOSURE BULLETIN, vol. 25, no. 12, 1 May 1983 (1983-05-01), New York, US, pages 6378 - 6379, XP002219954
• [Y] TAKAOKA G H ET AL: "Preparation and catalytic activity of nano-scale Au islands supported on TiO2", NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH, SECTION - B: BEAM INTERACTIONS WITH MATERIALS AND ATOMS, NORTH-HOLLAND PUBLISHING COMPANY. AMSTERDAM, NL, vol. 121, no. 1, 1997, pages 503 - 506, XP004057973, ISSN: 0168-583X
• [Y] REE J ET AL: "REACTION OF ATOMIC OXYGEN WITH ADSORBED CARBON MONOXIDE ON A PLATINUM SURFACE", JOURNAL OF CHEMICAL PHYSICS, NEW YORK, NY, US, vol. 104, no. 2, 8 January 1996 (1996-01-08), pages 742 - 757, XP002936467, ISSN: 0021-9606
• See references of WO 0129938A1

Designated contracting state (EPC)
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)
WO 0129938 A1 20010426; AP 2002002499 A0 20020630; AU 1434901 A 20010430; BR 0014907 A 20021001; CA 2388429 A1 20010426; CN 1409883 A 20030409; EA 200200432 A1 20021031; EP 1232546 A1 20020821; EP 1232546 A4 20030102; IL 149221 A0 20021110; JP 2003512729 A 20030402; KR 20020075862 A 20021007; MX PA02003978 A 20040906; NO 20021870 D0 20020419; NO 20021870 L 20020614; OA 12069 A 20060504

DOCDB simple family (application)
US 0028930 W 20001019; AP 2002002499 A 20001019; AU 1434901 A 20001019; BR 0014907 A 20001019; CA 2388429 A 20001019; CN 00817068 A 20001019; EA 200200432 A 20001019; EP 00976599 A 20001019; IL 14922100 A 20001019; JP 2001531182 A 20001019; KR 20027005136 A 20020420; MX PA02003978 A 20001019; NO 20021870 A 20020419; OA 1200200116 A 20001019