

Title (en)

HYDROGEN PRODUCTION FROM HYDROCARBONS BY PLASMA PYROLYSIS

Title (de)

HERSTELLUNG VON WASSERSTOFF AUS KOHLENWASSERSTOFFEN DURCH PLASMAPYROLYSE

Title (fr)

PRODUCTION D'HYDROGÈNE À PARTIR D'HYDROCARBURES PAR PYROLYSE AU PLASMA

Publication

**EP 4237372 A1 20230906 (EN)**

Application

**EP 21884192 A 20211101**

Priority

- US 202063107555 P 20201030
- CA 2021000099 W 20211101

Abstract (en)

[origin: WO2022087708A1] A method for producing hydrogen and carbon powder from the plasma pyrolysis of hydrocarbons is disclosed and includes a DC non-transferred electric arc plasma torch, a hot-wall reactor, for example lined with refractory or a graphite (slippery material), and a cyclone. The cyclone is adapted to recover heavier carbon particles and allow part of the hydrogen, unconverted hydrocarbon and lighter carbon particles to be recycled to the reactor to improve the overall yield of hydrogen. The prolonged contact with the plasma plume provides a typically complete conversion to hydrogen and carbon powder due to the hot walls of the reactor. The carbon powder leaving the plasma plume solidifies into a graphite-like powder in the reactor. A turbulence inside the reactor is adapted to prevent the buildup of soot on a reactor surface via the recycling of hydrogen, hydrocarbon gas or carbon powder or a mix of thereof to the reactor.

IPC 8 full level

**C01B 3/24** (2006.01); **B01D 53/047** (2006.01); **C01B 3/02** (2006.01); **C01B 32/00** (2017.01); **C01B 32/205** (2017.01)

CPC (source: EP)

**C01B 3/24** (2013.01); **C01B 3/50** (2013.01); **C01B 3/56** (2013.01); **C01B 32/05** (2017.08); **C01B 32/205** (2017.08); **B01D 2256/16** (2013.01); **B01D 2257/702** (2013.01); **B01D 2259/402** (2013.01); **C01B 2203/0272** (2013.01); **C01B 2203/04** (2013.01); **C01B 2203/043** (2013.01); **C01B 2203/048** (2013.01); **C01B 2203/0485** (2013.01); **C01B 2203/0861** (2013.01); **C01B 2203/0872** (2013.01); **C01B 2203/148** (2013.01); **C01B 2203/16** (2013.01); **Y02C 20/20** (2013.01); **Y02P 20/10** (2015.11); **Y02P 20/129** (2015.11); **Y02P 20/151** (2015.11); **Y02P 20/50** (2015.11)

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

Designated validation state (EPC)

KH MA MD TN

DOCDB simple family (publication)

**WO 2022087708 A1 20220505**; CA 3196986 A1 20220505; CN 117255709 A 20231219; EP 4237372 A1 20230906

DOCDB simple family (application)

**CA 2021000099 W 20211101**; CA 3196986 A 20211101; CN 202180079617 A 20211101; EP 21884192 A 20211101