Title (en)

COMPOUNDS, PROCESSES, AND MACHINERY FOR CONVERTING METHANE GAS INTO METHANE-SULFONIC ACID

Title (de)

VERBINDUNGEN, VERFAHREN UND MASCHINE ZUR UMWANDLUNG VON METHANGAS IN METHANSULFONSÄURE

Title (fr)

COMPOSÉS, PROCÉDÉS ET ÉQUIPEMENT POUR CONVERTIR DU GAZ MÉTHANE EN ACIDE MÉTHANESULFONIQUE

Publication

EP 3959192 A4 20220518 (EN)

Application

EP 19796737 A 20190425

Priority

- US 2019029024 W 20190425
- US 201815917631 A 20180310
- US 201815917632 A 20180310

Abstract (en)

[origin: WO2019212835A2] Improved initiators, solvents, and processing equipment and methods are disclosed for improving the yields and efficiency of a manufacturing process which uses a radical chain reaction to convert methane (CH4), which is a gas under any normal conditions, into methane sulfonic acid (MSA), a liquid. MSA is useful and valuable in its own right, and it also can be processed to create desulfured fuels and other valuable chemicals. A preferred type of initiator combination has been identified, comprising at least two different peroxide sulfate compounds. One will act as a "primary" initiator for the chain reaction, while the other will act as a "chain-lengthening oxidant", which can eliminate chain-terminating species, such as sulfur Di-oxide, in the MSA-forming reactor. Integrated continuous-loop processing systems also are disclosed, including a first variant which uses a mixture of sulfuric acid and MSA as the solvent, and a second variant which completely avoids sulfuric acid and uses MSA only, as the solvent. Options are also disclosed which can avoid any need for distillation, to create reduced-cost "rough grades" of MSA with purity levels which will be entirely adequate for various types of uses in bulk.

IPC 8 full level

C07C 303/06 (2006.01); **C07C 309/04** (2006.01); **C07C 407/00** (2006.01); **C07C 409/44** (2006.01)

CPC (source: EP)

C07C 303/06 (2013.01); **C07C 407/00** (2013.01); **C07C 409/44** (2013.01); Y02P 20/582 (2015.11)

Citation (search report)

- No further relevant documents disclosed
- See references of WO 2019212835A2

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

DOCDB simple family (publication)

WO 2019212835 A2 20191107; **WO 2019212835 A3 20200730**; CA 3093412 A1 20191107; CA 3093412 C 20230221; CA 3153432 A1 20191107; EP 3959192 A2 20220302; EP 3959192 A4 20220518; EP 4159714 A1 20230405; EP 4159715 A1 20230405

DOCDB simple family (application)

US 2019029024 W 20190425; CA 3093412 A 20190425; CA 3153432 A 20190425; EP 19796737 A 20190425; EP 22205417 A 20190425; EP 22205418 A 20190425