

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
25 November 2021 (25.11.2021)



(10) International Publication Number
WO 2021/237028 A1

(51) International Patent Classification:

C10L 1/04 (2006.01) C10L 1/02 (2006.01)
C10G 45/02 (2006.01)

(21) International Application Number:

PCT/US2021/033559

(22) International Filing Date:

21 May 2021 (21.05.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/028,704 22 May 2020 (22.05.2020) US
17/325,889 20 May 2021 (20.05.2021) US

(71) Applicant: **EXXONMOBIL RESEARCH AND ENGINEERING COMPANY** [US/US]; 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).

(72) Inventors: **KAR, Kenneth, C.H.**; 1949 Berrel Court, Yardley, PA 19067 (US). **RUBIN-PITEL, Sheryl, B.**; 232 South Chancellor Street, Newtown, PA 18940 (US). **LUO, Shifang**; 7 Pinehurst Circle, Annandale, NJ 08801 (US). **SMILEY, Randolph, J.**; 1835 Viola Lane, Hellertown, PA 18055 (US). **GUAY, Lisa, M.**; 1 Washington Avenue #12-1B, Morristown, NJ 07960 (US).

(74) Agent: **MIGLIORINI, Robert, A.** et al.; Exxonmobil Research and Engineering Company, 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(54) Title: ULTRA LOW SULFUR MARINE FUEL COMPOSITIONS

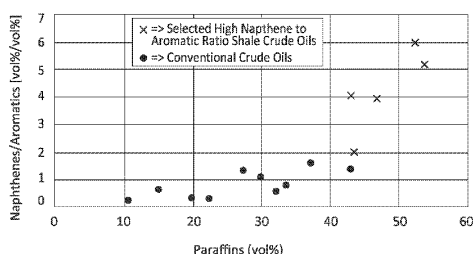
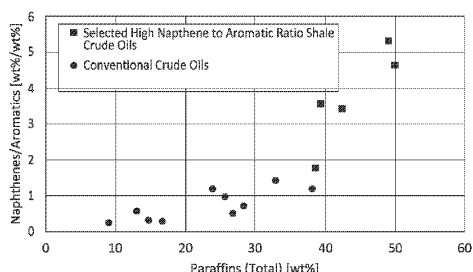


FIG. 1

(57) Abstract: Hydroprocessed residual fuel and/or fuel blending components are provided that have a sulfur and nitrogen level comparable to liquefied natural gas (LNG). Because of the low starting level of sulfur and/or nitrogen, the severity of the hydroprocessing that is needed, for the crude oil or bottoms fraction in order to remove sulfur to a level that is comparable to LNG is reduced or minimized. This can allow the resulting marine residual fuels to have low carbon intensity, low SO_x and NO_x emission and high energy density. Since the hydroprocessed fractions correspond to a fuel oil product, the resulting marine fuel can be used in existing fleets, and can be distributed in existing bunkering systems.

[Continued on next page]

Published:

— with international search report (Art. 21(3))