



(51) International Patent Classification:

C10B 53/07 (2006.01) C08J 11/04 (2006.01)
C10G 11/18 (2006.01)

(21) International Application Number:

PCT/US2023/016853

(22) International Filing Date:

30 March 2023 (30.03.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/326,707 01 April 2022 (01.04.2022) US

(71) Applicant: **CHEVRON U.S.A. INC.** [US/US]; 6001
Bollinger Canyon Road, San Ramon, CA 94583 (US).

(72) Inventor: **TIMKEN, Hye-Kyung, C.**; Chevron Corpora-
tion, P.O. Box 6006, San Ramon, CA 94583 (US).

(74) Agent: **HAYWORTH, Melissa, M.** et al.; Merchant &
Gould, P.O. Box 2903, Minneapolis, MN 55402 (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, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG,

KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,
MA, MD, MG, MK, MN, MU, 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.

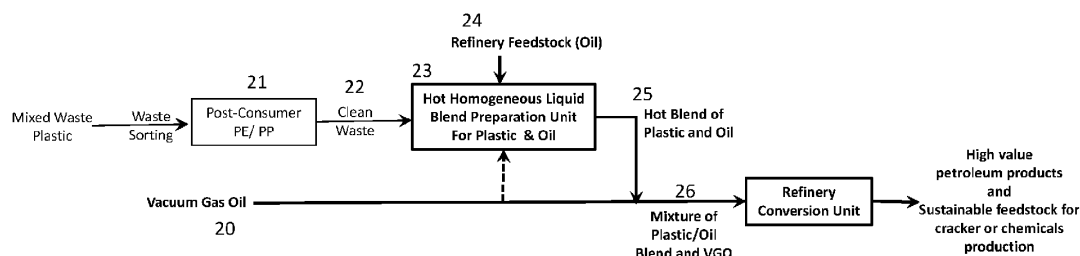
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, CV,
GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST,
SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ,
RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ,
DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT,
LU, LV, MC, ME, 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).

Published:

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

(54) Title: CIRCULAR ECONOMY FOR PLASTIC WASTE TO POLYPROPYLENE AND BASE OIL VIA REFINERY HYDRO-
CRACKING UNIT

Figure 2
Preparation of a Hot Homogeneous Blend of Plastic and Petroleum Feedstock
for Direct Conversion of Plastic Waste in Oil Refinery Units



(57) Abstract: Provided is a continuous process for converting waste plastic into recycle for polypropylene polymerization. The process comprises selecting waste plastics containing polyethylene and/or polypropylene and preparing a stable blend of petroleum and the selected plastic. The amount of plastic in the blend comprises no more than 20 wt. % of the blend. The blend is passed to a refinery hydrocracking unit. A liquid petroleum gas C₃ olefin/paraffin mixture is recovered from the hydrocracking unit. The C₃ paraffins and C₃ olefins are separated into different fractions with the C₃ olefin fraction passed to a propylene polymerization reactor, and the C₃ paraffin fraction passed optionally to a dehydrogenation unit to produce additional propylene. A heavy fraction can also be recovered from the hydrocracking unit and passed to an isomerization dewaxing unit to prepare base oil.