



- (51) **International Patent Classification:**
C22B 3/20 (2006.01)
- (21) **International Application Number:**
PCT/IB2021/061024
- (22) **International Filing Date:**
26 November 2021 (26.11.2021)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
63/118,677 26 November 2020 (26.11.2020) US
- (71) **Applicant: NEGATIVE EMISSIONS MATERIALS, INC.** [US/US]; 651 N Broad St, Suite 206, Middletown, New Castle, Delaware 19709 (US).
- (72) **Inventors: LEY, Jeremy William;** 140 Rue de la Croix Nivert, 75015 Paris (FR). **DREISINGER, David;** 134 49 Street, Delta, British Columbia V4M 2P2 (CA).

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).

- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

(54) **Title:** INTEGRATION OF CARBON SEQUESTRATION WITH SELECTIVE HYDROMETALLURGICAL RECOVERY OF METAL VALUES

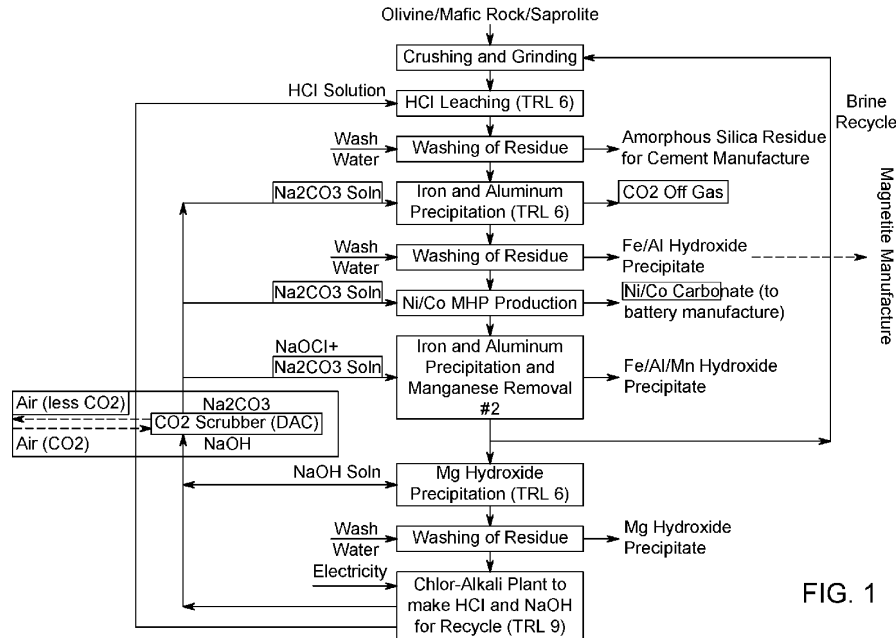


FIG. 1

(57) **Abstract:** Processes are provided in which successive steps of hydrometallurgical value extraction may be carried out using the products of carbon capture and an electrolytic reagent-generating process. The electrolytic process provides an acid leachant and an alkali hydroxide, with the alkali hydroxide then available for use either directly as a precipitant in the hydrometallurgical steps, or available for conversion by carbon capture to an alkali metal carbonate that can in turn be used as the precipitant in the selective hydrometallurgical steps.

[Continued on next page]

Published:

- *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*