

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
25 March 2021 (25.03.2021)



(10) International Publication Number
WO 2021/054897 A1

(51) International Patent Classification:

<i>C01B 32/162</i> (2017.01)	<i>C10J 3/66</i> (2006.01)
<i>C01B 32/184</i> (2017.01)	<i>C01B 3/32</i> (2006.01)
<i>C01B 32/186</i> (2017.01)	<i>C01B 3/34</i> (2006.01)
<i>B09B 3/00</i> (2006.01)	<i>C01B 3/38</i> (2006.01)
<i>B29B 17/04</i> (2006.01)	<i>C10B 49/02</i> (2006.01)
<i>C08J 11/12</i> (2006.01)	<i>C10B 49/04</i> (2006.01)
<i>C10B 53/02</i> (2006.01)	<i>B82Y 30/00</i> (2011.01)
<i>C10J 3/60</i> (2006.01)	<i>B82Y 40/00</i> (2011.01)

(21) International Application Number:

PCT/SG2020/050531

(22) International Filing Date:

17 September 2020 (17.09.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10201908635T 17 September 2019 (17.09.2019) SG

(71) Applicant: NATIONAL UNIVERSITY OF SINGAPORE [SG/SG]; 21 Lower Kent Ridge Road, Singapore 119077 (SG).

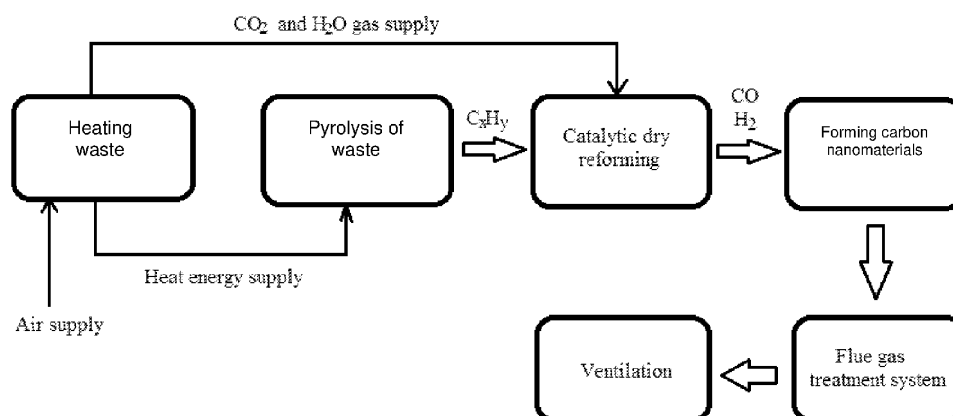
(72) Inventors: **LI, Fong Yau Sam**; c/o National University of Singapore, Faculty of Science, Department of Chemistry, 21 Lower Kent Ridge Road, Singapore 119077 (SG). **LIN, Xuanhao**; c/o National University of Singapore, Faculty of Science, Department of Chemistry, 21 Lower Kent Ridge Road, Singapore 119077 (SG).

(74) Agent: **PATEL, Upasana**; Marks & Clerk Singapore LLP, Tanjong Pagar Post Office, P O Box 636, Singapore 910816 (SG).

(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,

(54) Title: WASTE TREATMENT SYSTEM

Figure 1(a)



(57) Abstract: There is provided a method of treating waste comprising: heating waste to generate inert gases and carbon dioxide; pyrolysing the waste in the presence of the inert gases and carbon dioxide to form a mixture of hydrocarbons; catalytically dry reforming the mixture of hydrocarbons to form at least carbon monoxide and hydrogen; and forming carbon nanomaterials from the carbon monoxide and hydrogen. There is also provided a system for treating waste.

[Continued on next page]

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).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

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