



(51) International Patent Classification:

C01B 31/04 (2006.01) *C09D 193/00* (2006.01)
B82Y 40/00 (2011.01)

(21) International Application Number:

PCT/IN2014/000310

(22) International Filing Date:

8 May 2014 (08.05.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

1074/KOL/2013 17 September 2013 (17.09.2013) IN

(71) **Applicants:** **TATA STEEL LIMITED** [IN/IN]; Research and Development and Scientific Services, Jamshedpur 831001 (IN). **COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH** [IN/IN]; Anusandhan Bhawan, 2, Rafi Marg, New Delhi - 110001 (IN).

(72) **Inventors:** **SHYAM, Kumar Choudhary**; of Tata Steel Limited, Research and Development, Jamshedpur - 831007 (IN). **MANISH, Kumar Bhadu**; of Tata Steel Limited, Research and Development, Jamshedpur - 831007 (IN). **TAPAN, Kumar Rout**; of Tata Steel Limited, Research and Development, Jamshedpur - 831007 (IN). **SUM-ITESH, Das**; of Tata Steel Limited, Research and Development, Jamshedpur - 831007 (IN). **RANJAN, Kumar Sahu**; of Council of Scientific and Industrial Research, Anusandhan Bhawan, 2 Rafi Marg, New Delhi - 110001 (IN). **YASHABANTA, Narayan Singhbabu**; of Council of Scientific and Industrial Research, Anusandhan Bhawan, 2 Rafi Marg, New Delhi - 110001 (IN). **ASHIT, Kumar Pramanick**; of Council of Scientific and Industrial Research, Anusandhan Bhawan, 2 Rafi Marg, New Delhi - 110001 (IN).

search, Anusandhan Bhawan, 2 Rafi Marg, New Delhi - 110001 (IN). **VIKAS, Chandra Srivastava**; of Council of Scientific and Industrial Research, Anusandhan Bhawan, 2 Rafi Marg, New Delhi - 110001 (IN).

(74) **Agents:** **G.S. DAVAR** et al.; L S Davar & Co., 32 Radha Madhav Dutta Garden, Lane, Kolkata - 700010 (IN).

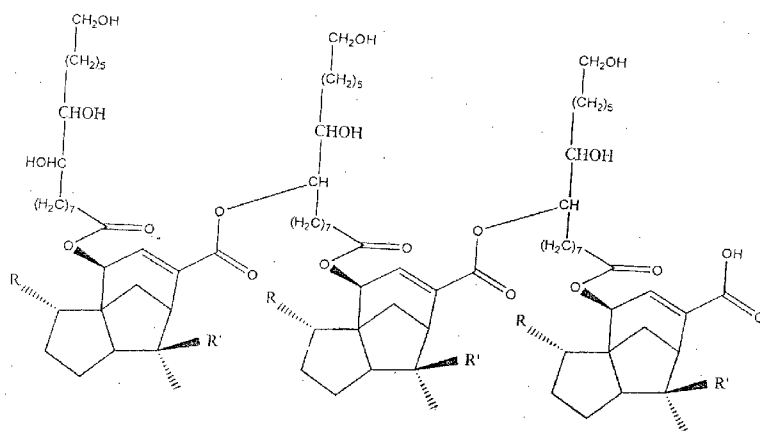
(81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, 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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, 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).

Published:

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

(54) **Title:** A PROCESS FOR SYNTHESIZNG REDUCED GRAPHENE OXIDE ON A SUBSTRATE FROM SEEDLAC



(57) **Abstract:** The present invention relates to synthesizing reduced graphene oxide on the surface of a metal sheet and glass. The invention particularly relates to a process for coating a substrate with reduced graphene oxide using seedlac as a carbon source. As per the process of the current invention, a solution of seedlac is prepared in an alcohol and the substrate is dipped in to the solution for one or more time. The substrate is then dried in air for 1-10 minutes and thereafter, heated to a temperature range of 400 to 1200°C under controlled atmosphere of Ar / N₂ / Ar-H₂ / N₂-H₂ at a different flow rate ranging from 100 to 500 seem for a period of 10 to 120 minutes.

