



- (51) **International Patent Classification:**  
*G01N 21/77* (2006.01) *G01N 21/43* (2006.01)
- (21) **International Application Number:**  
PCT/MY2023/050020
- (22) **International Filing Date:**  
30 March 2023 (30.03.2023)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (71) **Applicant:** **VULCAN PHOTONICS SDN. BHD.**  
[MY/MY]; D-11-08, Menara Suezcap 1 KL Gateway, No. 2,  
Jalan Kerinchi, Kampung Kerinchi, Kuala Lumpur, 59200  
(MY).
- (72) **Inventors:** **JAMALUDIN, Farah Hidayah Binti**; No 70,  
Jalan Pulau Perdana 2/3, Taman Pulau Perdana, Johor Bahru,  
Johor, 81110 (MY). **KOO, Khong Nee**; No. 32 Lengkok  
Paya Terubong, Ayer Itam, Pulau Pinang, 11060 (MY). **ED-  
WARD, Evianie Bingak**; Blok H TGT G-3 Phasa 3 Apart-  
ment Residence Larkin, Jalan Dato Jaafar, Johor Bahru, Jo-  
hor, 80350 (MY). **FONG, Mun Oon**; 118 B4-06-02, Putra  
Place Condo, Persiaran Bayan Indah, Bayan Lepas, Pulau  
Pinang, 11900 (MY).
- (74) **Agent:** **HEMINGWAY, Christopher Paul** et al.; Marks  
& Clerk (Malaysia) Sdn Bhd, Unit 6, Level 20, Tower A,  
Menara UOA Bangsar, 5 Jalan Bangsar Utama 1, Taman  
Bangsar, Kuala Lumpur, 59000 (MY).

(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).

**Declarations under Rule 4.17:**

— of inventorship (Rule 4.17(iv))

**Published:**

— with international search report (Art. 21(3))  
— in black and white; the international application as filed  
contained color or greyscale and is available for download  
from PATENTSCOPE

(54) **Title:** OPTICAL WAVEGUIDE SENSOR FOR DETECTING ARSENIC IONS AND METHOD OF FABRICATING THE SAME

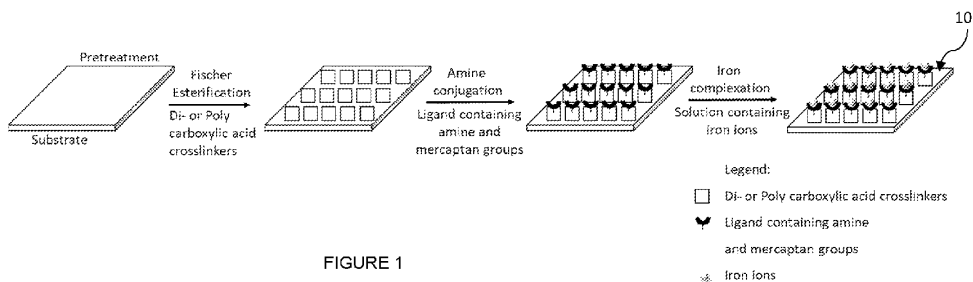


FIGURE 1

(57) **Abstract:** The present invention relates to a method for forming an optical waveguide sensor for detecting arsenic ions in an aqueous solution. The method comprising the steps of treating a substrate with solvents, coating the treated substrate surface with a crosslinking agent selected from a group comprising carboxylic acid functional group containing organic molecules for forming a crosslinked substrate surface, coating the crosslinked substrate surface with a ligand comprising an amine functional group and mercaptan functional group for forming a functionalized substrate surface containing a layer of ligand surface, and complexing the layer of ligand surface with a solution containing iron ions for forming a functionalized substrate surface containing layer of ligand surface containing iron ion cores that is capable of binding with arsenic ions in an aqueous solution. The present invention also relates to the optical waveguide sensor for detecting arsenic ions fabricated with the method of the present invention.