

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
22 June 2023 (22.06.2023)



(10) International Publication Number
WO 2023/111552 A1

(51) International Patent Classification:
C10L 1/238 (2006.01) C10L 10/06 (2006.01)
(21) International Application Number:
PCT/GB2022/053218

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).

(22) International Filing Date:
14 December 2022 (14.12.2022)

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

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2118104.5 14 December 2021 (14.12.2021) GB

(71) Applicant: **INNOSPEC LIMITED** [GB/GB]; Innospec
Manufacturing Park, Oil Sites Road, Ellesmere Port
Cheshire CH65 4EY (GB).

(72) Inventors: **REID, Jacqueline**; C/o Innospec Limited, In-
nospec Manufacturing Park, Oil Sites Road, Ellesmere Port
Cheshire CH65 4EY (GB). **CROSS, Adele**; C/o Innospec
Limited, Innospec Manufacturing Park, Oil Sites Road,
Ellesmere Port Cheshire CH65 4EY (GB). **ROBERTS,
Martin**; C/o Innospec Limited, Innospec Manufacturing
Park, Oil Sites Road, Ellesmere Port Cheshire CH65 4EY
(GB). **ROSS, Alan**; C/o Innospec Limited, Innospec Man-
ufacturing Park, Oil Sites Road, Ellesmere Port Cheshire
CH65 4EY (GB).

(74) Agent: **APPLEYARD LEES IP LLP**; 15 Clare Road, Hal-
ifax Yorkshire HX1 2HY (GB).

(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, 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, 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,

(54) Title: METHODS AND USES RELATING TO FUEL COMPOSITIONS

(57) Abstract: A method of cleaning up deposits in an indirect injection diesel engine, the method comprising combusting in the engine a diesel fuel composition comprising a quaternary ammonium salt additive; and optionally one or more further nitrogen-containing detergents; wherein the quaternary ammonium salt additive comprises the quaternised reaction product of a hydrocarbyl substituted succinic acid derived acylating agent and a compound able to react with said acylating agent and which includes a tertiary amine group; wherein each molecule of the hydrocarbyl substituted succinic acid derived acylating agent includes on average at least 1.2 succinic acid moieties.

WO 2023/111552 A1