

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
25 June 2020 (25.06.2020)



(10) International Publication Number
WO 2020/132075 A2

(51) International Patent Classification:
C08K 5/521 (2006.01) C08K 5/5317 (2006.01)

(21) International Application Number:
PCT/US2019/067184

(22) International Filing Date:
18 December 2019 (18.12.2019)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/782,948 20 December 2018 (20.12.2018) US
62/923,446 18 October 2019 (18.10.2019) US

(71) Applicant: LANXESS SOLUTIONS US INC. [US/US];
2 Armstrong Road, Shelton, CT 06484 (US).

(72) Inventors: BONYHADY, Simon, J.; 34 Taft Pointe, Unit
73, Waterbury, CT 06708 (US). LEE, Julia, Yuc; 270
Spring St., Apt. 14, Naugatuck, CT 06770 (US). HE,

Qingliang; 250 Harrison Rd., Cheshire, CT 06410 (US).
SHARMA, Ramesh; 70 Ridgeview Place, Cheshire, CT
06410 (US).

(74) Agent: MCDAVID, Christopher, L.; Lanxess Solutions
US Inc., 2 Armstrong Road, Shelton, CT 06484 (US).

(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, 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, 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,

(54) Title: METHOD OF PREPARING PHOSPHORUS-CONTAINING FLAME RETARDANTS AND THEIR USE IN POLYMER
COMPOSITIONS

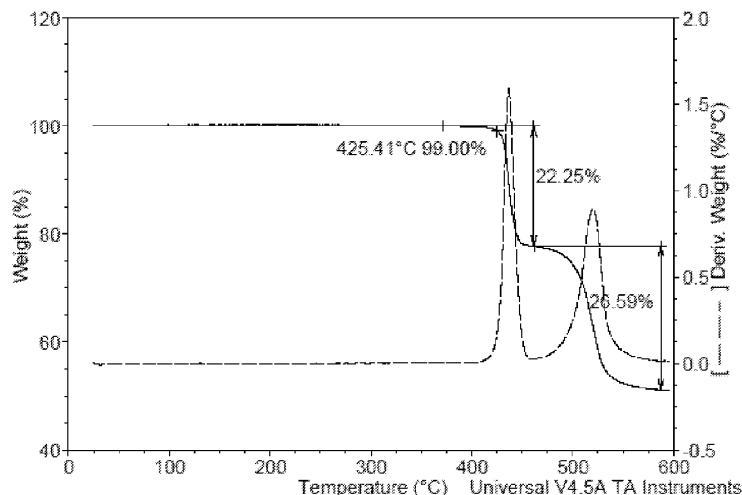


FIG. 1

(57) Abstract: A phosphorus-containing flame retardant is produced by reacting at a reaction temperature a mixture including a metal or suitable metal compound and a stoichiometric excess relative to the metal or suitable metal compound of an unsubstituted or alkyl or aryl substituted phosphonic or pyrophosphonic acid, wherein the phosphonic or pyrophosphonic acid is in a molten state at the reaction temperature. The chemical composition of the resulting flame retardant product leads to excellent flame retardancy and exhibits high thermal stability. The presently disclosed flame retardants are useful, for example, in polymer compositions, particularly thermoplastics processed at high temperatures, over a wide range of applications.

[Continued on next page]

WO 2020/132075 A2

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).

Published:

- *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*