L 00653-67 EWT(l)/EWP(m)/EWT(m) WW/JW

ACC NR: AT6023753 SOURCE CODE: UR/3149/66/000/003/0153/0161

AUTHOR: Yershin, Sh. A.; Rybalova, R. P.

ORG: none

12

B+1

TITLE: Thermal regime of ignition in a Couette flow

SOURCE: Alma-Ata. Kazakhskiy nauchno-issledovatel'skiy institut energetiki. Problemy teploenergetiki i prikladnoy teplofiziki, no. 3, 1966, 153-161

TOPIC TAGS: Couette flow, ignition, combustion, heat transfer

ABSTRACT: An analysis was made of the conditions for the ignition of a combustible gas mixture located between two flat plates having different temperatures. The cold plate moves relative to the hot plate and imparts motion to the fluid (Couette flow). Under such conditions, a velocity profile is established which depends on the viscosity. The heat transfer can take place under the following three conditions: 1) by conduction through the medium from the hot to the cold plate; 2) heat is transferred only through the cold plate, but not through the hot plate due to energy dissipation and chemical reaction; and 3) a temperature maximum is established in the flow due to a substantial chemical reaction. Two solutions were obtained. For the case where

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L 00653-67

ACC NR: AT6023753

ignition takes place at the wall, it was found that ignition takes place at a lower "hot" wall temperature when the thermal conductivity of the mixture, the time of heat removal, and the velocity of the cold plate increase. For the other case when ignition takes place in the flow, a formula was obtained for calculating the distance of the ignition center from the wall. Orig. art. has: 3 figures and 21 formulas.

[PV]

SUB CODE: 21/ SUBM DATE: none/ ORIG REF: 005/ ATD PRESS: 5040

Card 2/2 vlr

L 08569-67 EWP(m)/EWT(1)/EWT(m) WW/JW/JWD/WE

ACC NR: AP6032975 SOURCE CODE: UR/0031/66/000/009/0048/0050

AUTHOR: Yershin, Sh. A.; Rybalova, R. P.; Yarin, L. P.

61

ORG: none

TITLE: Calculation of a diffusion flame in the transient flow region

SOURCE: AN KazSSR. Vestnik, no. 9, 1966, 48-50

TOPIC TAGS: combustion, diffusion flame, propulsion, combustion rate, transient flow, flow velocity, turbulent flame

ABSTRACT: The length of diffusion flames in laminar flow regimes is directly proportional to the gas flow velocity. With increasing flow velocity, the flame becomes turbulent and the regime is transient. At high flow velocities, the flame is fully turbulent, and the length does not depend on the flow velocity. The turbulent and laminar regimes have been previously studied, but the transient regime, which involves both molecular and turbulent transfer, has not yet been thoroughly studied. In the present study, experiments in the transient regime were made with carbon monoxide and hydrogen combustion, and the following formula was derived for calculating the flame length:

$$\frac{l_f}{d} = \beta \frac{Re}{K_T Re + \left(\frac{1}{B_c} - K_T Re\right) e^{-\alpha Re}}$$

Card 1/3

L 08569-67

ACC NR: AP6032975

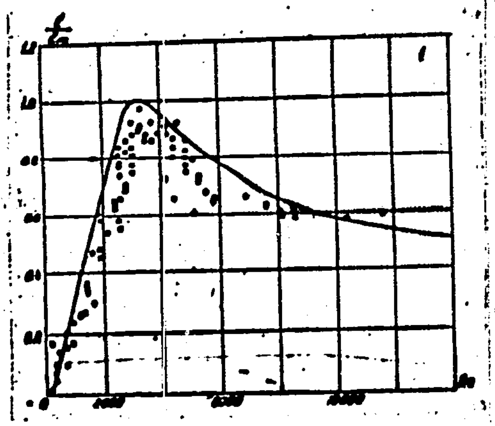

Fig. 1

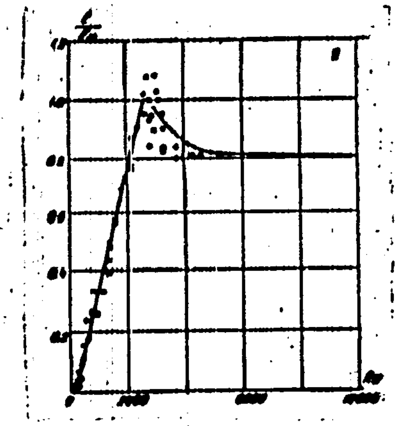

Fig. 2

Figs. 1 and 2. Comparison of calculated and experimental results on the dependence of the flame length of the Reynolds number

Fig. 1. Carbon monoxide; Re_{max} = 3300; Re_{cr} = 2700; k_T = 1.115.10^{-3}; a = 0.0001815.

Fig. 2. Hydrogen; Re_{max} = 2700; Re_{cr} = 2700; k_T = 0.3.10^{-3}; a = 0.00154.

Card 2/3

L 08569-67

ACC NR: AP6032975

where S_c is the Schmidt number; K_T, empirical coefficient in the expression for eddy diffusivity; l_f, flame length; d, burner diameter; u, gas flow velocity; β, a coefficient allowing for the physico-chemical properties of the gas; D, diffusivity; Re, Reynolds number; and α is given by

$$\alpha^2 = \frac{1}{Re_{max}[Re_{max}K_T S_c - 1]},$$

(where Re_{max} = the Reynolds number corresponding to the maximum flame length); α can be determined experimentally. R_* is given by $D_{MT} = D_T + (D_M - D_T)e^{-\alpha^2 Re}$, where D_{MT} is overall molecular-eddy diffusivity, D_T is the eddy diffusivity, and D_M is the molecular diffusivity. Orig. art. has: 2 figures and 4 formulas. [WA No. 68]

SUB CODE: 21/ SUBM DATE: none/ ORIG REF: 008/ OTH REF: 003

Card 3/3

BAYAKHUNOV, A. Ya.; VDOVENKO, M. I.; YERSHINA, L. M.

Oxidation rate of copper sulfides. Izv. AN Kazakh. SSR. Ser. energ. no.2:63-70 '62. (MIRA 16:1)

(Copper sulfide)

VERSHININA, L.K.

Nature, distribution, and methodology of calculating rainfalls in the Maritime Territory. Trudy GGI no.79:149-163 '60. (MIRA 15:8)

(Maritime Territory—Rain and rainfall)

YERSHKOV, A.A., inzhener

[redacted]

Reducing the number of grades of food products. Standartizatsiia no.2:43-45 Mr-Ap '55. (MIRA 8:6)

1. Komitet standartov, mer i izmeritel'nykh priborov pri Sovete Ministrov SSSR
(Food--Standards)

YERSHKOV, N. [redacted]

The congress that prepared the socialist revolution. Sov.profsoiuzy 5 no.8:93-95 Ag '57. (MLRA 10:8)
(Russian Social Democratic Party)

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YERSHKOV, N.D., starshiy nauchnyy sotrudnik

Technical and economic effectiveness of the change-over of freight cars to roller bearings. Zhel.dor.transp. 42 no.11:23-26 N '60. (MIRA 13:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo transporta Ministerstva putey soobshcheniya.
(Railroads--Freight cars) (Roller bearings)

YERSHKOV, N.D., inzh.

Technical and economic advantages of the conversion of freight cars to roller bearings. Trudy TSNII MPS no.221:46-55 '61. (MIRA 15:1)

(Roller bearings) (Railroads--Freight cars)

YERSHKOV, N.D., inzh.

Experience in the operation of cylindrical roller bearings in the driving axles of VL60 electric and TEP60 diesel locomotives. Trudy TSNII MPS no.295:4-18 '65.

Some problems of the lowering of contact pressures in cylindrical axle roller beatings. Ibid.:104-118

(MIRA 19:1)

YERSHKOV, O.P.

History of railroad track system management. Trudy po ist.tekh. no.11:68-83 '54.
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YERSHKOV, O.P., kandidat tekhnicheskikh nauk

Determining rail coefficients allowing for lateral bending and torsion. Trudy TSNII MPS no.97:289-325 '55. (MLRA 8:12)
(Railroads--Rails)

YERSHKOV, O.P., kandidat tekhnicheskikh nauk; MELENT'YEV, L.P., kandidat tekhnicheskikh nauk; YAKHOV, N.S., inzhener.

New norms for constructing and maintaining rails on the curved parts of tracks. Zhel.dor.transp. 38 no.10:64-69 O '56. (MLRA 9:11)
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YERSHKOV, O.P., kandidat tekhnchsskikh nauk.;NAUMOV, A.M., inzhener.;
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More initiative and inventiveness. Put' i put. khoz. no.1:29-31 Ja
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Guarantee evenly distributed track elasticity. Put' i put. khoz. no.3:24-26 Mr '59. (MIRA 12:6)
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Shortcoming in the present system of checking and evaluating track condition. Zhel. dor. transp. 41 no.1:70-73 Ja '59.
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(Railroads--Traffic)

SHAKHUNYANTS, Georgiy Mikhaylovich, doktor tekhn. nauk; AMELIN, S.V., prof., retsenzent; KONSTANTINOV, V.N., dots., retsenzent; SMIRNOV, M.P., retsenzent; YAKOVLEV, V.F., retsenzent; BOCHENKOV, M.S., kand.tekhn. nauk, retsenzent; BROMBERG, Ye.M., retsenzent; YERSHKOV, O.P., retsenzent; ZVEREV, B.N., retsenzent; ZOLOTARSKIY, A.F., retsenzent; IVASHCHENKO, G.I., retsenzent; LINEV, S.A., retsenzent; MARKAR'YAN, M.A., retsenzent; POPOV, V.V., retsenzent; POPOV, S.N., retsenzent; SEREBRENNIKOV, V.V. retsenzent; SHAFRANOVSKIY, A.K., retsenzent; NOVITSKIY, G.I., inzh., retsenzent; VIKTOROV, I.I., kand.tekhn.nauk, retsenzent; VYSOTSKIY, A.F., kand.tekhn.nauk, retsenzent; SAATCHYAN, G.G., kand.tekhn.nauk, retsenzent; YAKOVLEVA, Ye.A., kand.tekhn.nauk, retsenzent; TITOV, V.P., kand.tekhn.nauk, retsenzent; GRUSHEVOY, N.G., inzh., red.; BROMBERG, Ye.M., kand.tekhn.nauk, red.; KHITROV, P.A., tekhn. red.

[Railroad tracks] Zheleznodorozhnyi put'. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1961. 615 p. (MIRA 14:12)

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(Railroads—Track) (Railroad engineering)

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Data diagram of the side pressure of the rolling stock on the track.
Put' i put.khoz. 5 no.10:26-28 O '61. (MIRA 14:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo transporta.

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682