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Author keywords
1 of 1
Indexed keywords
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Document type
Conference Paper
Source type
Conference Proceedings
ISBN
979-835035978-7
DOI
10.1109/MEES61502.2023.10402443
Publisher
Institute of Electrical and Electronics Engineers Inc.
Original language
English
View less

Proceedings of the 5th International Conference on Modern Electrical and Energy System, MEES 2023 - 2023 - 5th IEEE International Conference on Modern Electrical and Energy System, MEES 2023 - Kremenchuk - 27 September 2023 through 30 September 2023 - Code 196931

Research of the Vibration Mode of Combustion of Water-Fuel Emulsion for Improving the Efficiency Indicators of the Power Plant

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Abstract

The process of oscillating fluctuations of the gas flow begins during the combustion of the water-fuel emulsion as a result of microexplosions of its droplets, therefore, theoretical studies of thermo-acoustic processes in the combustion chamber when using pre-prepared water-fuel emulsion must be considered, starting from the mechanism of phase transformations of the water-fuel emulsion. Therefore, in this article, possible mechanisms of self-excitation of acoustic vibrations, features of the burning of emulsion droplets, which are presented graphically in the form of dependencies, were considered. The mechanisms of phase transformations in water-fuel emulsion droplets were studied, which made it possible to obtain an acoustic impulse of the combustion process of water-fuel emulsion in the combustion chamber of the power plant. © 2023 IEEE.

Author keywords

combustion chamber; phase transformation; power plant; resonator; water-fuel emulsion

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Engineering controlled terms

Drops; Emulsification; Emulsions; Flow of gases; Oscillating flow; Phase transitions; Resonators

Engineering uncontrolled terms

Acoustic process; Efficiency indicators; Emulsion droplets; Fuel emulsions; Micro explosion; Phases transformation; Theoretical study; Thermo-acoustics; Vibration modes; Water-fuel emulsion

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Combustion chambers

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References (18)

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1 Zagirnyak, M., Prus, V., Nikitina, A. Special features of energy consumption and quality of electricity in low-voltage networks of industrial and utility enterprises (2016) Technical Electrodynamics, 2016 (4), pp. 74-76. Cited 9 times.
2 Orlova, E., Glushkov, D., Abedtazehabadi, A., Belyaev, S., Feoktistov, D. Influence of the Texture Configuration of Heating Surfaces Created by Laser Irradiation on the Ignition and Combustion Characteristics of Liquid Fuels (Open Access) (2023) Applied Sciences (Switzerland), 13 (1), art. no. 95. Cited 2 times.
3 Pariotis, E.G., Zannis, T.C., Rakopoulos, C.D., Hountalas, D.T. Comparative Assessment of the Impact of Water Addition either to the Intake Air or in Diesel Emulsion on the Performance and Emissions of a HDDI Diesel Engine (2020) Journal of Energy Engineering, 146 (5), art. no. 04020051. Cited 3 times.
4 Janta-Lipińska, S., Shkarovskiy, A., Chrobak, Ł.B. Disposal of Wastewater from Mazout-Fired Boiler Plants by Burning Water-Mazout Emulsions (2022) Energies, 15 (15), art. no. 5554.
5 Orlova, E., Glushkov, D., Abedtazehabadi, A., Belyaev, S., Feoktistov, D. Influence of the Texture Configuration of Heating Surfaces Created by Laser Irradiation on the Ignition and Combustion Characteristics of Liquid Fuels (2023) Applied Sciences (Switzerland), 13 (1), art. no. 95. Cited 2 times.
6 Suleiman, B., Selim, H., Dawood, A., Khalidi, A., Vasudevarao, K., Goldmeer, J., Al-Ahmadi, K., (...), Al-Gahatani, M. COMPUTATIONAL INVESTIGATION OF USING EMULSIFIED FUELS IN HEAVY DUTY GAS TURBINES (2022) Proceedings of the ASME Turbo Expo, 3-B, art. no. V03BT04A011.
7 Soulayman, S., El-Khatib, R. The Effect of Fuel Emulsion on Fuel Saving in Fire Tube Boilers of Tartous Company for Cement and Construction Materials (2020) J. Sol. Energy Res. Updates, (7), pp. 1-6.
8 Strtett, D.V. Sound Theory. Book on Demand, p. 2021.
9 Westlye, F.R. (2018) Experimental Study of Liquid Fuel Spray Combustion. Cited 3 times.
10 Jiang, G., Yu, M., Yang, Y., Jiang, Y., Zhang, W., Sun, J. Effect of sound excitation on the flow field and convection heat transfer around a cylinder (2023) International Journal of Thermal Sciences, 185, art. no. 108110.
11 Gowrishankar, S., Krishnasamy, A. Emulsification – A promising approach to improve performance and reduce exhaust emissions of a biodiesel fuelled light-duty diesel engine (Open Access) (2023) Energy, Part C 263, art. no. 125782.
12 Horiachkyn, V., Korniyenko, V. Intensity of Corrosion Processes in Wastewater Boilers During the Combustion of Water-Fuel Emulsions (2018) Mar. eng. technol., (2), pp. 101-110.
13 Kornienko, V.S. System for complex exhaust gas cleaning of internal combustion engine with water-fuel emulsion burning (2019) Refrigeration Eng. Technol., 58 (1), pp. 28-33.
14 Filipshchuk, A.N., Kolbasenko, O.V., Shevtsov, A.P., Dymo, B.V. Technology for improving technical, economic and ecological efficiency of boiler plants using physico-chemical correction of the water-fuel emulsions composition (Open Access) (2021) Problems of the Regional Energetics, (3), pp. 62-77.
15 Shen, S., Che, Z., Wang, T., Yue, Z., Sun, K., Som, S. A model for droplet heating and evaporation of water-in-oil emulsified fuel (2020) Fuel, 266, art. no. 116710.
16 Singh, G., Lopes, E., Hentges, N., Ratner, A. Experimental investigation of water emulsion fuel stability (2019) ASME International Mechanical Engineering Congress and Exposition, Proceedings (IMECE), 7. Cited 2 times.
17 Korniylov, V., Kondratev, E. Combustion of single carbon particles in an acoustic pulsating flow (2011) Phys. Aerosol Syst., 23, pp. 127-141.
18 Wang, Z., Yuan, B., Cao, J., Huang, Y., Cheng, X., Wang, Y., Zhang, X., (...), Liu, H. A new shift mechanism for micro-explosion of water-diesel emulsion droplets at different ambient temperatures (2022) Applied Energy, 323, art. no. 119448.

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