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N 92 **Numerical** Simulation of Aerodynamic and Thermal Characteristics of Pulverized Fuel: monograph / A. Askarova, S. Bolegenova, Sh. Gumarova, L. Strautman. – Almaty: Qazaq universiteti, 2017. – 166 p.
ISBN 978-601-04-3064-8

The physical and mathematical model used in the monograph, which gives a rigorous description of the main processes of heat and mass transfer in combustion chambers, and the method of constructing a geometric model of a real combustion chamber in combination with modern computing technologies, using capabilities of modern supercomputers, enable us to carry out a comprehensive study of all characteristics of the solid fuel combustion process in a rather short period of time.

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SYMBOLS AND ABBREVIATIONS

V – volume, m^3
ρ – density, kg/m^3
S_ϕ – source member
p – pressure, Pa
τ_{ij} – viscous stress tensor
x, y, z – coordinates
ϕ – generalized transport variable
Γ_ϕ – generalized exchange coefficient
δ_{ij} – Kronecker symbol
m – mass, kg
T – temperature, $^0C(K)$
h – specific enthalpy, kJ / kg
k – kinetic energy of turbulence, m^2/s^2
K_{abs} – optical absorption coefficient, 1/m
D – diffusion coefficient, m^2/s
ε – the rate of dissipation of turbulent kinetic energy, m^2/s^3
μ- dynamic viscosity, kg/m·s
$C_{\varepsilon 1}$, $C_{\varepsilon 2}$, c_μ - empirical constants of the turbulence model
σ – stoichiometry coefficient
d – particle diameter (m)
E_c – activation energy (J / mol)
k_d – diffusion coefficient
k_c – chemical velocity coefficient
S_{ext} – total external surface per unit mass of the coke particle, m^2
Q_{chem} – energy released in a chemical reaction
I_v - intensity of radiation, $kW/m^2 \cdot rad$
Ω – solid angle, rad
Θ – flat angle, degree
Pr – Prandtl number
Ma- Mach number