Adiabatic flame temperatures of common fuels in oxygen at constant pressure

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Combustion is a chemical reaction between substances, usually including oxygen and usually accompanied by the generation of heat and light in the form of flame. The rate or speed at which the reactants combine is high, in part because of the nature of the chemical reaction itself and in part because more energy is generated than can escape into the surrounding medium, with the result that the temperature of the reactants is raised to accelerate the reaction even more. Combustion encompasses a great variety of phenomena with wide application in industry, the sciences, professions, and the home, and the application is based on knowledge of physics, chemistry, and mechanics; their interrelationship becomes particularly evident in treating flame propagation. In general terms, combustion is one of the most important of chemical reactions and may be considered a culminating step in the oxidation of certain kinds of substances. Though oxidation was once considered to be simply the combination of oxygen with any compound or element, the meaning of the word has been expanded to include any reaction in which atoms lose electrons, thereby becoming oxidized. In addition to chemical reactions, physical processes that transfer mass and energy by diffusion or convection occur in gaseous combustion. In the absence of external forces, the rate of component diffusion depends upon the concentration of the constituents, pressure, and temperature changes, and on diffusion coefficients. The latter are either measured or calculated in terms of the kinetic theory of gases. The process of diffusion is of great importance in combustion reactions, in flames, that is, in gaseous mixtures, and in solids or liquids. Diffusion heat transfer follows a law stating that the heat flux is proportional to the temperature gradient. The coefficient of proportionality, called the thermal conductivity coefficient, is also measured or calculated in terms of the kinetic theory of gases, like the diffusion coefficient.

Fuel, Oxidizer, Adiabatic flame temperature (degrees Celsius)

Acetylene	Oxygen	3480
Cyanogen	Oxygen	4525
Dicyanoacetylene	Oxygen	4990
Methylacetylene	Oxygen	2927
Anthracite	Oxygen	3500
Aluminum	Oxygen	3732
Lithium	Oxygen	2438
Phosphorus	Oxygen	2969
Zirconium	Oxygen	4005