

The heat is on

What is fire made of? What is its atomic structure, what causes things to burst into flame in the first place and why can't all materials be made to produce flame?

Fire involves a chemical reaction between fuel and atmospheric oxygen. Once initiated it is self-sustaining, generates high temperatures and releases a combination of heat, light, noxious gases and particulate matter.

The visible flame is the region in which this chemical process occurs and so flame is essentially a gas phase phenomenon. For flaming combustion to occur, solid and liquid fuels must be converted into gaseous form.

For liquid fuels this is achieved by evaporative boiling. For solid fuels, the solid is chemically decomposed through the process of pyrolysis to generate volatile gases.