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Hydrogen as a Fuel in Jet Engine

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Abstract

We know that combustion in a jet engine is a very powerful phenomenon and it produces high energy. The fuel that is usually used is ATF (aviation turbine fuel). It is a specialized type of petroleum-based fuel used to power an aircraft.Now the problem associated with the ATF is pollution that is generated from its combustion thereby resulting in global warming and other harmful effects .So to preventthis, the best way is to use alternate source of energy i.e. HYDROGEN which is most abundant in nature and is suitable for efficient and powerful combustion.It gives water and energy as products in the process henceresulting in clean and eco-friendly environment. Hydrogen is an element having atomic number as 1 and atomic mass of 1.0794.The thermodynamic properties of hydrogen are also favourable. Hydrogen gas is highly flammable and burnsin the air at a rate of4% and 75% by volume. The enthalpy of combustion is 286KJ/mol. The mixture can be ignited by spark orheat. In case of jet engine it can be a source of pollution free energy. The required hydrogen will be supplied from compressed hydrogen tank. Since the combustion enthalpy is very high, it can be used as fuel in jet engines providing high thrust. The storage will be done more or less the same as that of ATF. There are a certain number of disadvantages in using hydrogen as a fuel because it has high flame travel velocity and the combustion may be uncontrollable which may result in fatigueand accident. Since there have been advancements in technology, it is possible to keep the hydrogen in a vessel without any precautions. The rapid fire and fast flames can be controlled by various methods such as flame stabilisation and delay time period principle.