

THE ELEMENTAL

Placing Safety at the Center of Hydrogen

CENTER FOR
Hydrogen
SAFETY

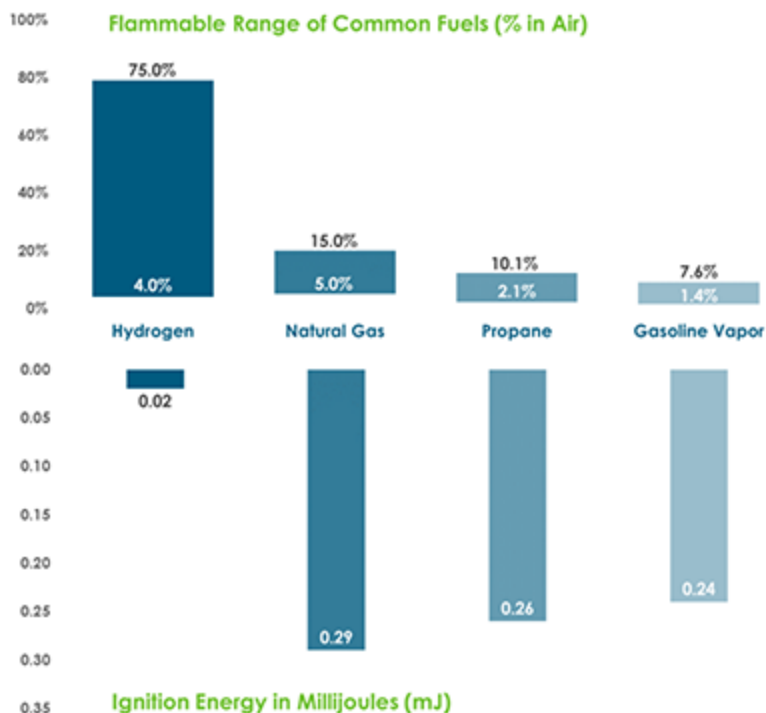


Hydrogen Flammability

All fuels have a unique flammable range, which is the minimum and maximum concentration in air necessary for combustion to occur. For combustion to occur, a fuel within its flammable range, must also be exposed to an ignition source. Hydrogen's flammability range (between 4% and 75% in air) is extensive compared to other fuels, as shown below.

Along with its wide flammability range, one safety concern with hydrogen is that it takes very little energy to ignite. Under the optimal combustion condition (a 29% hydrogen-to-air volume ratio), the energy required to initiate hydrogen combustion is much lower than that required for other common fuels (e.g., a small spark will ignite it), as shown. But at low concentrations of hydrogen in air, the energy required to initiate combustion is like that of other fuels.

The first line of defense against avoiding a fire or explosion is to prevent hydrogen from accidentally mixing with an oxidizer. Proper system and component design, installation, and maintenance can all help prevent leaks in hydrogen equipment. If a leak does occur, ventilation can act to dilute the hydrogen to keep the concentration below its lower flammable limit.



Read more about this and other hydrogen safety topics at www.h2tools.org.
Please contact us at chs@aiche.org if you have a suggestion for a future topic.