

EFFECTS OF A MAGNETIC FIELD ON FUEL

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I would like to help you understand that a magnetic field can alter the behavior of non-polar organic molecules found in motor fuel.

First, you need to comprehend the concept of an energy field. One kind of energy field with which we cope each minute is the field of gravity in which we live. For some reason each body having a mass has an attraction for each other body having a mass. The force of that action depends on the quantity of each mass and the distance that separates them. The gravitation field of a given large mass body such as the Sun or the Earth extends in all directions, but is "felt" only by whatever other body is in a given portion of that field. The source of gravitational energy, the reason why it exists, is not easily explained but through experience we know that it exists.

Another kind of energy field by which energy extends into space without mechanical connection is a magnetic field. What we know about magnetic fields is different from what we know about gravitational fields. We know that magnetic energy originates in the way in which the essential electrons found in all matter spin. This constant movement of electrons is described by a branch of mathematics called quantum mechanics, which, for the sake of the average reader, we will not employ in this writing.

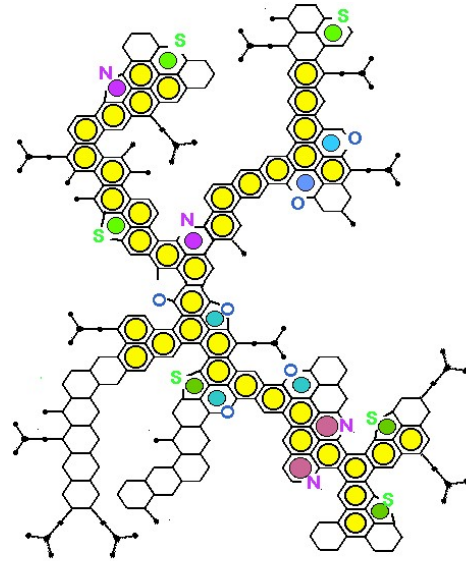
Most of the furiously moving electrons in most of the stable atoms and stable molecules in the Universe are paired. For want of a truly intimate knowledge, we say that one electron of an electron pair is spinning in one direction and the other electron of the pair spinning in the opposite direction. Paired electrons with this balanced arrangement exhibit no external magnetic activity, because the spin in one direction cancels the effect of the spin in the other direction.

A magnetic field is set up when some body, for example an iron bar magnet or the Earth's core, has a lot of unpaired electrons, we say, spinning in the same direction. The energy influence of these un-paired electrons is transmitted through space to affect other electrons in other bodies. A magnetic field is created by the magnetized iron bar magnet or the Earth's core. For centuries mankind has been able to see the effects of a magnet, without fully understanding how or why it works. A magnetic field extends into a finite space. The electrons in the atoms of matter coming into this magnetic field might be affected by the energy of the magnetic field in a remote transfer of energy.

Most of what is known about magnets involves polar materials in a magnetic field. For example, when mechanical energy is exerted to make a metal rotate in a magnetic field, a flow of electrons (electricity) is created and the mechanical energy is converted into electric energy. In an electric motor the energy of moving electrons is converted to mechanical energy. Many other examples of the behavior in a magnetic field of metals or polar inorganic and even polar organic materials have been studied. However, our concern is with completely non-polar materials, where normally there are no electrons that are not neatly balanced in pairs.

A hydrocarbon fuel consists of molecules made from atoms of carbon and hydrogen, which are collected by what are called covalent bonds. In such bonds an individual atom will share a pair of electrons with a neighboring atom. Two carbon atoms might share two electrons and by doing so they are held together.

Each carbon atom can be connected in four different directions. For example, a given carbon atom might form a sharing partnership with two other carbon atoms in order to be a link in a chain. At the same time this same carbon atom will form a sharing partnership with two hydrogen atoms. Each of the bonds, the C-C bonds or the C-H bonds consists of shared and paired electrons. Normally the two electrons in each covalent bond have balanced opposite spins. "Normal" properties of non-polar molecules such as the hydrocarbons in gasoline, diesel fuel and related materials presuppose such electron spin-balanced chemical bonds.



Consider the properties of a liquid that can freeze to become a solid or vaporize to become a gas. Each hydrocarbon such as we are considering has a characteristic temperature at which it will boil and a lower characteristic temperature at which it will freeze. In the series of hydrocarbons (that have no branched chains), both the melting point and the boiling point increase as a function of the molecular weight, or the number of carbon atoms in the chain. The bigger the molecule, the higher the boiling temperature and the freezing temperature. Ordinary liquid fuels consist of mixtures of hydrocarbon molecules of various sizes.

In a fuel liquid held between the freezing (melting) point and the boiling point, where energy is constantly being transferred from one molecule to another as they vibrate and collide with each other, some molecules will be close to the energy state at which they might fly off as a gas. Other molecules will be close to the energy state that allows them to "snuggle up" to another like molecule in what is the start of a chunk of solid material.

Consider a diesel fuel with an extraordinary number of large molecules, which are associated as incipient solids in the liquid mixture. Consider such a liquid-incipient solid mixture being placed into a strong magnetic field. The energy of the magnetic field will cause some, maybe just a few of the paired, opposite spinning electrons to have parallel spins. The molecules with the parallel spin components will seem strange to the molecules next to them and they will not as easily "nestle" next each other. Thus the solidification process will be interrupted. There will not be so many "almost-solid" particles in the liquid.

This may be what we see when a somewhat off-grade fuel that normally has in it small portions of solid paraffin which collects in a filter. A substantial number of these microscopic lid particles will "blind" the filter. The same fuel, after treatment in a magnetic field, easily passes through a

filter. In this case the microscopic portions of solid paraffin have not formed or have been broken up. This has been observed in numerous instances in the use of an in-line magnetic device.

Consider now the fuel being pumped into a combustion chamber where there is a source of ignition, a lot of oxygen and an elevated temperature. If a molecule is already somewhat activated with some parallel spinning electrons, it will be a bit more inclined to oxidize more rapidly than the same kind of molecule with all the paired electrons spinning in opposite directions. This may explain why test equipment shows lower consumption of fuel to achieve a given horsepower production when a magnetic device is in the fuel line.

A rational explanation for the results observed in the use of magnetic fuel treatment devices, both in terms of the increased filterability and in more efficient fuel utilization is that magnetic field changes the electron spins in some, perhaps not very many, but enough, of the covalent bonds in the hydrocarbons.