

Can magnetic fields influence chemical reactions? About charlatans and electron spins

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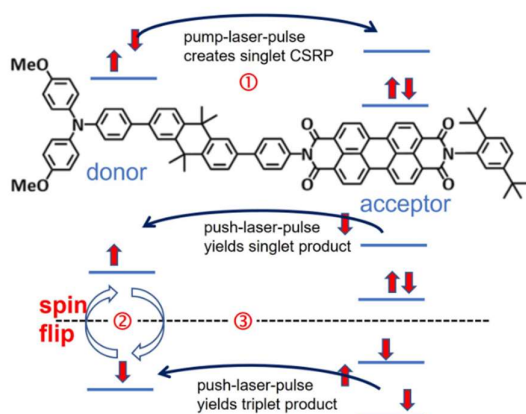
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Magnetic fields have been used for several hundred years to “heal” a plethora of illnesses. Several organisms are known to be able to sense the Earth magnetic field. A prominent example are migratory birds such as the European robin. This suggests that magnetic fields might influence physiological, that is, chemical processes. In this talk I will give an overview about possible and impossible chemical mechanisms that might depend on



magnetic fields. Using donor-acceptor dyads and triads I will show that by photoinduced electron transfer, spin correlated radical pairs can be formed whose spin interconversion depends on a variety of magnetic field dependent processes. One of those processes is the coherent spin interconversion driven by the isotropic hyperfine coupling interaction. By a new, purely optical pump-push spectroscopy technique we could directly monitor an oscillatory behavior of the spin interconversion, thus proving its coherent quantum nature



Pump-Push spectroscopy allows to monitor the time evolution of the singlet-triplet population