

# Electron Spin Relaxation in Organic Semiconductors

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Organic semiconductors (OSC) and devices based on those have been penetrating many areas of research and the industry, notably displays employing organic light-emitting diodes (OLEDs). One of the most investigated and studied physical property in this material and device class is the behaviour of the spin degree of freedom in OSC and organic devices. This research interest is fuelled – from a fundamental research point of view – by the unusually long spin coherence time of the order of  $\mu\text{s}$  and – from a device perspective – by the fact that the spin property often plays a key role in the device functionality, such as the well-established spin-dependence of the recombination rate in OLEDs.

In my talk I will start with a scientific background of the current understanding of spin behaviour in organic materials, also suitable for undergraduate students. It follows the main part of the seminar, which is concerned with

- a) How the electron spin relaxation rate and mechanism can be measured with the so-called muon spin relaxation technique (MuSR) and
- b) How we can access spin relaxation mechanisms by modifying organic molecules surgically precise at a microscopic level.

Eventually, I will show that we were also able to access information about spin currents in so-called organic-metal hybrid spinvalve devices with this MuSR technique.