

# VCD helps others in molecular aggregates

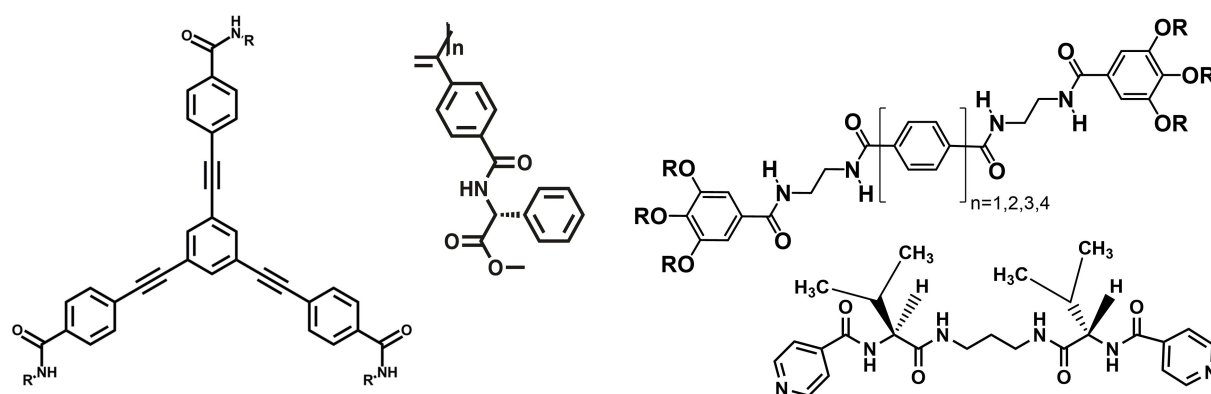
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Molecular self-assembly is the driving force of a great number of physical, chemical and biological processes in Nature.<sup>1</sup> The properties of the molecular aggregates are markedly dependent on the intermolecular forces which hold together the building blocks, but also on the chemical and structural features of these building blocks. The transference of properties from the individual molecules to the bulk aggregate can be summarized in three main behaviours: disappearance (dipole moment), direct sum (weight) and enhancement (resilience). A nice example of the last group is the optical activity. The presence of a chiral seed in the molecules modulates their folding by favouring one among the available macrostructures. As a consequence, new forms of supramolecular chirality are triggered, such as helical, spiral or chiral sheets, which usually give rise to a noticeable increasing of the chiral signal of the aggregates.

Vibrational circular dichroism (VCD) is the chiral version of infrared spectroscopy. It combines the intramolecular view provided by the molecular vibrations with the selective capability of a chiral analysis. It is also a suitable technique to observe the aggregation-induced signal enhancement in any type of condensed phase (solid, liquid, gel, etc). Here we present a series of studies on supramolecular systems, Figure 1, in which VCD helps and improves the analysis obtained by other techniques of chiral analysis as electron microscopy (SEM, AFM), electronic circular dichroism (ECD), Raman optical activity (ROA) or circularly polarized luminescence (CPL). These studies are aimed to obtain structural information of the macromolecular scaffolding useful to control the features and applications of the aggregates.



**Figure 1.** Chiral building blocks of the polymers studied in this work.

## References

[1] Lehn, J.M. *Science*, **2002**, 295, 2400-2403.