



## Silsesquioxanes from the inside out - modifications and emerging functions

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Silsesquioxanes (SQs) represent a group of specific organosilicon representatives of diverse architectures from random, to strictly defined. Their uniqueness results from the presence of an inorganic Si-O-Si core and tuneable functional organic coronae. This classifies them as hybrid systems. The nature of these defined constructions has an impact on their physicochemical properties, and this affects their wide range of applications.[1] Continuous interest in the chemistry of functionalized silsesquioxanes and their appliance is a derivative of not only a few types of core of diverse structures but also the variety of organic moieties that can be attached to it.

In this lecture, our recent studies on the formation of functionalized silsesquioxanes with diverse core architecture will be presented. The kind of reactive group at the Si-O-Si core influences the type of modification to which they may be subjected. Protocols based on TM-mediated catalytic reactions are of special importance because of their effectiveness and high selectivities, e.g. hydrometallation, coupling or click processes, Friedel-Crafts reaction, etc. As a result, a variety of organic structures may be bounded by the inorganic core, affecting their appliance. One of its interesting directions is coordination chemistry. Additionally, as the inorganic core may be the scaffold for different amounts of reactive moieties, it may be a complex building block to react with a polymer matrix, resulting in the formation of hybrid materials, *i.e.* grafted polymers, cross-linked systems, or 3D networks, and also coordination polymers. These systems exhibit interesting physicochemical characteristics [2,3]. Interestingly, in some aspects, the results of those modifications may be quite unexpected.

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### References

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