

# Surface chemistry of diamond for quantum applications

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## Abstract

The surface of diamond plays an important role for its properties. Not only is the surface itself the origin of characteristics such as zeta potential, wettability, aggregation behaviour etc., also lattice defects such as the NV or the SiV center can be influenced in their charge states by the nature of the surface termination or the attachment of larger functional groups. The latter can be also exploited for sensing applications using lattice defects as luminescent or spin sensors.

It is thus of utmost importance to properly control the surface groups and to develop methods for the efficient and highly reproducible functionalization of diamond materials.

In this presentation, methods for the initial termination of diamond with different atoms such as H, O and F will be presented. Further, the attachment of larger surface groups applicable as sensors, for the prevention of non-specific interactions and other applications will be shown. Additionally, highly sensitive methods for the quantitative assessment of surface groups will be presented.

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