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Defects on Magnesium Oxide Surfaces: An STM and ESR Study

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Thin MgO(100) films have been prepared on Ag(100) und Mo(100) substrates. Color centers are not present on these MgO surfaces but can be induced by electron bombardment. F^+ and F^0 centers may be identified with scanning tunnelling spectroscopy and found to be located not on terrace but rather on edge sites primarily. This is corroborated by electron spin resonance experiments. Methods are described to engineer surfaces with particular defects and thus its interaction with both, molecules and metal atoms, can be studied. Additional techniques such as Fourier-Transform Infrared Spectroscopy allow us to get closer insight into the influence of defects on the properties of adsorbed atoms and molecules.