Hetreogeneous gas-solid reactions occur on the surface of a solid which gives rise to the general conjecture that bulk properties of a solid are not relevant for catalysis. This is, of course, correct when the interaction of a gas phase substrate with the „active centre" of a catalyst is considered. It will be shown, however, that the complex phenomenon of catalysis requires also the understanding of the creation of the „active centre" which is formed frequently only under the chemical influence of the gas phase substrate. The gaseous species can restructure the surface, change its chemical constitution or even become incorporated within the voids of the solid material. These processes require a dynamic response of the sub-surface regions of the catalyst and are hence the traditional field of solid state reactivity.
Several examples of technologically relevant partial oxidation reactions on oxides will be used to illustrate the immediate relevance of bulk solid state reactivity for surface heterogeneous reactions.