

Hydrogen and vacuum systems

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Abstract

Hydrogen is present in all materials. In UHV-systems, the outgassing of hydrogen often limits the ultimate pressure. Furthermore, when growing materials in HV, the presence of water implies close to an unlimited supply of hydrogen. Its presence often alters materials through changes in e.g.: elastic-, optical- and magnetic- properties as well as conductivity.

The absorption, desorption and diffusion of hydrogen in materials will be discussed in connection to pre-treatment of common construction materials. This includes air-baked and vacuum fired stainless steel as well as surface coating of different materials for use in UHV and XHV systems.

Implications of plasma-wall interactions in HV growth chambers will be discussed. Theoretical description of the absorption will be given and examples on the implications of the presence of hydrogen in materials will be treated.

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