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PHOTOCATALYTICALLY ACTIVE TITANIA PRODUCED BY MOCVD PLASMA PROCESSES

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Hitherto, the photoinduced benefits of titania have been attracting increasing attention during the past years and a widespread range of commercial products is available nowadays. An attractive topic has been the production of photocatalysts that are active at exposure to visible light since this characteristic will affect positively the growth of the market.
The deposition of photocatalytically active titania layers at ambient temperature has been developed using the plasma enhanced methods such as reactive dc sputtering and metal organic chemical vapour deposition(MOCVD) at low temperature. [1] The working pressure of the MOCVD plasma process can be increased up to atmospheric pressure. As a result, high deposition rates of up to 1000 nm/min have been achieved and temperature sensitive substrates have been coated using this technique. However, the crystallinity and the wettability of the titania layers seem to be influenced by the plasma parameters. The doping of the pure titania layers using non-metallic elements increases the photocatalytic activity by a factor of more than three in the UV/visible and the blue light region without strongly affecting the optical energy band gap.
The surface energy of pure and doped titania layers and their catalytic properties at exposure to 365 nm and 425 nm irradiation will be analysed in detail. Several methods will be applied in order to characterize the titania layers. The resulting anti-microbial and anti-fingerprint features will be interpreted and preliminary results regarding the structural and functional impact of doping the titania layers will be presented.
References:
[1]Sidney Chappuis, Anna Campiche, Damien Gilliéron, Eva Maria Moser, Jukka Lausmaa, Armin Reller,
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Keywords
titania
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