05-038 High temperature behavior and reactivity of tantalum oxide (Ta2O5)

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Due to its dielectric properties tantalum oxide is used in important technical applications. Beyond, the finishing of surfaces with tantalum oxide to generate layers of corrosion protection or scratch proofness has recently grown in significance. Nevertheless in literature there is not much information available concerning reactivity, morphology, phase transitions or temperature dependant behavior of tantalum oxide (Ta2O5). The reaction of Ta2O5 with amonia forms tantalum nitride oxide (TaON) and the stochiometric nitride Ta3N5 [1]. Thermal analysis methods such as Thermodilatometry (DIL), Thermogravimetry (TG) and Differential Scanning Calorimetry (DSC) as well as structural investigations by means of X-Ray Powder Diffraction (XRD) have been carried out in order to determine the high temperature behavior of tantalum oxide, tantalum oxide nitride and tantalum nitride.