Contribution ID: **237** Type: **not specified**

Minimum effective thickness for activation and low total electron yield of TiZrV non-evaporable getter coatings

Tuesday 10 April 2018 17:59 (1 minute)

Minimising the thickness of TiZrV non-evaporable getter (NEG) coatings is mandatory for increasing single-bunch instability thresholds in the proposed FCC-ee high luminosity lepton collider. After thermal activation the NEG surface is depleted of its O content and the total electron yield (TEY) decreases to values close to 1.1. The effect of reducing the thickness of NEG coatings on activation performance, number of possible activation cycles and TEY is investigated. Substrates of OFE copper are coated with TiZrV at thicknesses of 1100 nm, 200 nm, 87 nm and 30 nm by magnetron sputtering using a cathode of intertwisted elemental wires of Ti, Zr and V in a Kr working gas. Coated samples are then heated to temperatures of up to 250 ℃ in ultra-high vacuum and their surface chemistry is monitored with X-ray photoelectron spectroscopy (XPS), then TEY is measured using primary electrons with energies of up to 1800 eV. Samples are vented to atmosphere after activation and reactivated (cycled), up to three times to monitor the change in activation behaviour and TEY decrease upon activation. XPS measurements show a degraded activation with repeated cycling, and the effect is amplified for thinner NEG coatings and for shorter activation times. TEY measurements exhibit a decrease in the electron yield that is less effective for thinner coatings only after repeated activation cycles. These effects are thought to be linked to the delayed diffusion of O away from the surface due to accumulation of higher O concentrations in the film volume, an effect that is faster for thinner films.

Author: SINKOVITS, Theo Finley (CERN)

Co-authors: BELLI, Eleonora (Sapienza Universita e INFN, Roma I (IT)); SAPOUNTZIS, Antonios (CERN); COSTA PINTO, Pedro (CERN); TABORELLI, Mauro (CERN)

Presenter: SINKOVITS, Theo Finley (CERN)

Session Classification: Poster session

Track Classification: STP