



Influence of surface finishing on the electrochemical activity of the 2098-T351 aluminum alloy

**Rejane SILVA¹, Mariana MILAGRE¹, Leandro OLIVEIRA², Renato ANTUNES²,
Uyime DONATUS¹, Isolda COSTA¹**

¹ *Instituto de Pesquisas Energéticas e Nucleares, Brazil*

² *Universidade Federal do ABC, Brazil*

In this work, scanning electrochemical microscopy (SECM) measurements were employed to characterize the electrochemical activities of polished and as-received surfaces of the 2098-T351 aluminum alloy (AA2098-T351). The effects of the near surface deformed layer (NSDL) and its removal by polishing on the electrochemical activities of the alloy surface were evaluated and compared by the use of different modes of SECM. Confocal Laser Scanning Microscopy (CLSM) and energy dispersive X-ray spectroscopy (EDS) were also employed to characterize the morphology of the surfaces. The surface chemistry was analyzed by X-ray Photoelectron Spectroscopy (XPS). The generation/tip collection (SG/TC) and competition modes of the SECM were used to study hydrogen gas (H₂) evolution and oxygen reduction reactions, respectively. H₂ evolution and oxygen reduction were more pronounced on the polished surface compared to the as-received surface that revealed lower electrochemical activities showing that either the NSDL largely decreased the local electrochemical activities at the AA2098-T351 surface.