

課題番号 : F-14-AT-0081
 利用形態 : 技術代行
 利用課題名(日本語) :
 Program Title (English) : Investigation of the Adhesion of Metal Particles onto a PTFE-based Substrate
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1. 概要(Summary)

The objective of this study is to investigate the interface layer (adhesion) of metal traces deposited onto a PTFE-based substrate.

2. 実験(Experimental)

The metal trace was deposited onto the PTFE-based substrate and compared with the electrodeposited copper traces onto the same substrate. Due to the nature of the substrate, a challenge exists in terms of sample preparation for SEM viewing. As such, the metal trace-substrate interface layer was observed using FIB-SEM, where the cross-sectioning could be done in-situ. Prior to the FIB-SEM characterization, a layer of Palladium (100 nm) was sputtered onto the sample surfaces to minimize any electron charging during the FIB-SEM process.

3. 結果と考察(Results and Discussion)

Figures 1 and 2 show the cross-sections of the electrodeposited copper trace and the deposited metal trace respectively.

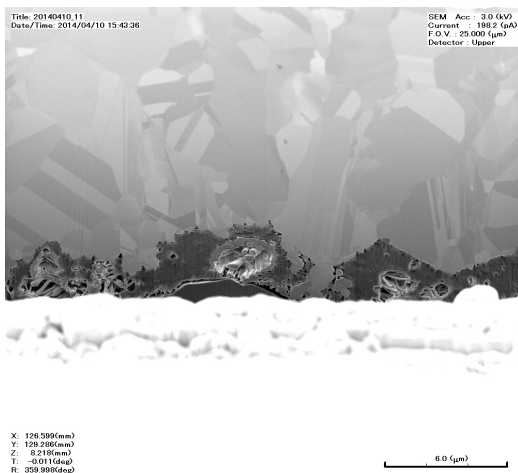


Fig.1 Electrodeposited copper on PTFE-based substrate.

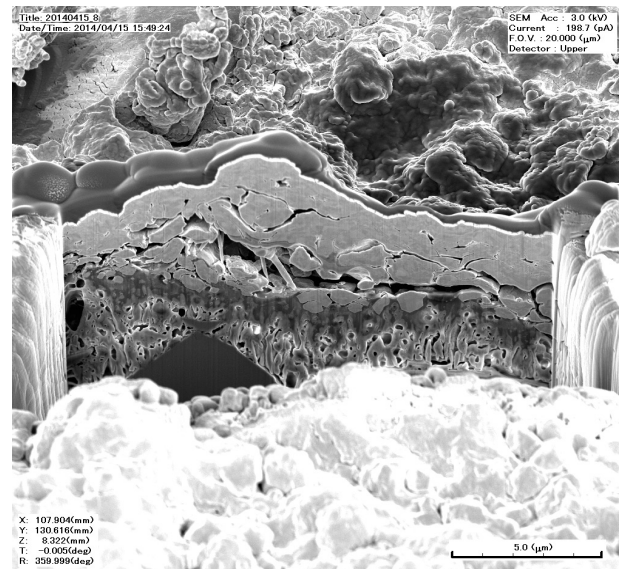


Fig. 2 Deposited metal onto PTFE-based substrate.

From Fig 1, it can be observed that the electrodeposited copper is intact (i.e no delamination) and conforms well to the substrate profile. In Fig. 2 a base metal layer could be observed, which indicates an anchoring of the metal particles onto the PTFE-based substrate. However, a delamination between the copper layers could be seen. This suggests that the adhesion between the metal layer and substrate may not be ideal. As such a further optimization of the deposition parameters is needed to alleviate the delamination between the metal layers for a good adhesion with the substrate.

4. その他・特記事項(Others)

Nil.

5. 論文・学会発表(Publication/Presentation)

Nil

6. 関連特許(Patent)

Nil