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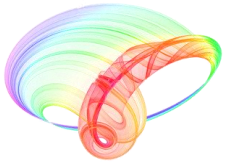

PHOTONICA2019

The Seventh International School and Conference on Photonics, 26 August – 30 August 2019, Belgrade, Serbia

& Machine Learning with Photonics Symposium (ML-Photonica 2019)

& ESUO Regional Workshop

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Editors: Milica Matijević, Marko Krstić and Petra Beličev

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Negative-Mode LDI-MS of corrosion products on the surface of Ag-Cu-X (X- Zn, Pd, In) alloys

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Copper-silver alloys have widely applied in many different areas such as information and communication technology, rail transportation, power transmission lines, microelectronics, machinery manufacturing, chemical processing industries, coinage, ornamental parts, etc [1, 2]. A group of ternary Ag-Cu alloys with different elements is used for binding different materials (brazing, fillers, and pastes). For example, Ag-Cu-Pd alloys are used in dentistry, as amalgams improvers or joint fillers for different dental materials [3]. Ternary AgCuIn alloy uses as a bonding metal layer; the use of AgCuIn as the bonding metal, greatly reduces the manufacturing costs of LED chip and helps to improve the life of the LED chip. Copper and its alloys belong to the group of semi-noble metals however they are not highly resistant to corrosion in some of the environments [4, 5]. Corrosion has particularly attracted attention due to the significant impact on the performance and reliability of this industrially important material group in their applications, as well as on the economy. Standard methods for characterization of corrosion films are: X-ray diffraction (XRD), Raman spectroscopy and scanning electron microscopy (SEM) with Energy Dispersive Spectroscopy (EDS) [6, 7]. The positive mode laser desorption ionization (LDI) mass spectrometry method can be successfully applied to analyze the composition of the corrosion film. In our previous work, it has been shown that the amount of sample required for the LDI method is much smaller than the sample quantity required for the methods mentioned above [8]. The purpose of this work was to study the possibilities of direct analysis of the corrosion films formed on $Ag_{60}Cu_{26}Zn_{14}$, $Ag_{58.5}Cu_{31.5}Pd_{10}$, and $Ag_{63}Cu_{27}In_{10}$ alloys using the negative mode laser desorption ionization (LDI) mass spectrometry method. The corrosion films of $Ag_{60}Cu_{26}Zn_{14}$, $Ag_{58.5}Cu_{31.5}Pd_{10}$, and $Ag_{63}Cu_{27}In_{10}$ alloys were obtained after anodic potentiostatic polarization treatment (at +0.25 V for 5 min in 3.5% wt. NaCl solution). Preliminary results show that the negative mode LDI mass spectra measured from the corrosion film of these alloys contains same ions$AgCl_2^-$, $AgCuCl_3^-$, $CuCl_2^-$, $Cu_2Cl_3^-$, $Cu_3Cl_4^-$. This result suggested that main reactions are the formation of CuCl layer on the surface of the Cu rich metallurgical phase and formation of AgCl film on the surface of Ag rich metallurgical phase**.**

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REFERENCES

[1] T. Hoang et al., J. Am. Chem. Soc. 140, 5791 (2018).
[2] W. Li et al., ACS Appl. Mater. Interfaces 9, 24711 (2017).
[3] E.H. Greener, K. Szurgot, J. Dent. Res. 61, 1192 (1982).
[4] G. W. Poling, Corros. Sci. 10, 359 (1970).
[5] F. Mansfeld, T. Smith, E. Parry, Corrosion 27, 289 (1971).
[6] A. L. Ma et al., Corros. Sci. 91, 245 (2015).
[7] D. de la Fuente et al., Corros. Sci. 110, 253, (2016).
[8] B. D. Vurdelja et al., Corros. Rev. 35, 473 (2017).