

Electrochemical dissolution of gold using ionic liquids

Vasko Jovanovski, Marjan Bele, Milutin Smiljanić, Nejc Hodnik, Angelja Kjara Surca

Laboratory for Electrocatalysis, Department of Materials Chemistry, National Institute of Chemistry, Hajdrihova 19, 1000 Ljubljana, Slovenia

In this presentation we will address the environmental impacts of traditional gold mining and refining methods, highlighting the use of hazardous chemicals and the resultant pollution, together with the significant energy consumption and carbon emissions associated with gold production from ore, contrasting it with the relatively lower environmental impact of gold recycling [1]. Various alternative recycling methods [2], including electrochemical processes and the use of ionic liquids, are explored as means to reduce chemical usage and environmental harm. Ionic liquids, with their unique properties [3], are investigated as promising media for the electrochemical dissolution of gold, offering insights into the formation of gold complexes and their effectiveness in the recycling process. The study employs in situ Raman spectroelectrochemistry and ab initio calculations to elucidate the mechanisms underlying gold dissolution in ionic liquids, aiming to optimize environmentally friendly recycling methods while minimizing ecological footprint.

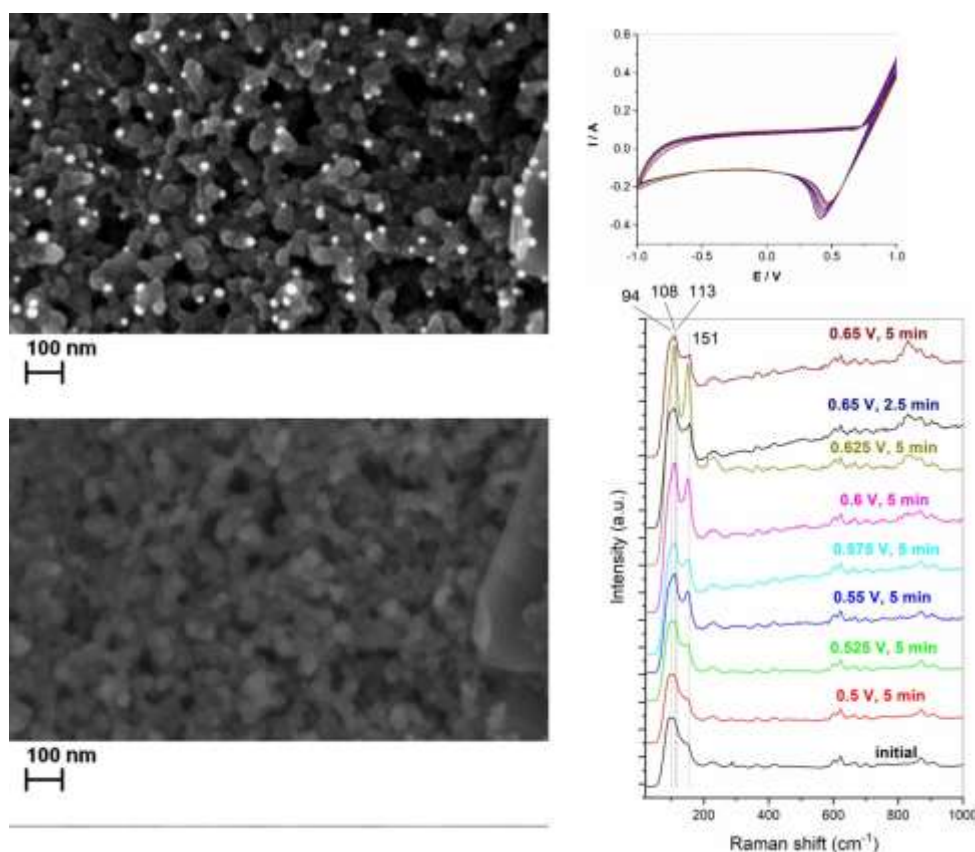


Figure 1. Top and bottom left: before and after SEM image of AuNP dissolution in 1-methyl-3-propylimidazolium iodide using 10 CV cycles depicted in top right image. Bottom right: in-situ Raman spectroelectrochemistry using amperometry at different potentials.

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References

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