Coverage effect of iodine and astatine adsorption on Au surfaces

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The use of radioactive group VII elements such as iodine and astatine labeled on gold nanoparticles are being researched as promising method for radiotherapy.[1,2)] Previous works have looked at their adsorption on flat (111) and stepped (211) surfaces and found that they are adsorbed covalently on the fcc hollow site and the edge-bridge site respectively.[3-6)]

To find out the limitations of such adsorptions, we performed a study on the coverage of iodine and astatine adsorptions on gold surfaces. This time, we look at both surfaces to compare the adsorption capabilities as well as looking at the effect that a more crowded surface would have on the adsorbates. We found that the gold surfaces are able to adsorb a substantial amount of radionuclides up to 0.75 monolayers. Based on this result, we can perform a rough calculation that shows a gold nanoparticle being able to adsorb hundreds of times the values obtained in experiments.[2,7)]

We hope that this interesting result can pique more interest in the experimental testing of this methodology. More in depth studies are still being performed and would be presented in the meeting.

References

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