

# 9<sup>th</sup> International Workshop on Electrodeposited Nanostructures

## Electrodeposited Bi thin films on GaAs substrates

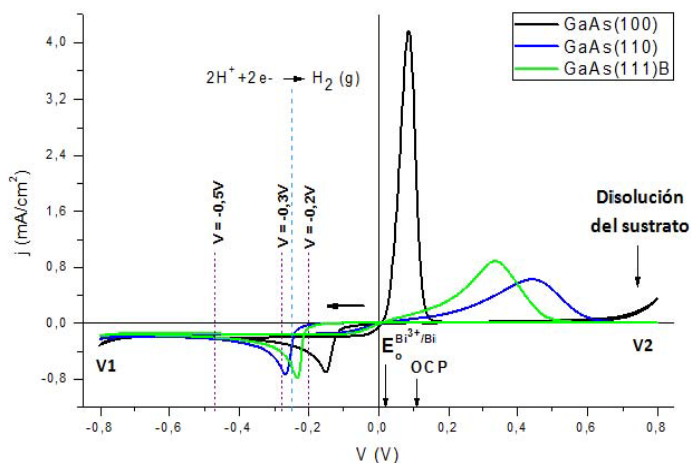
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Bismuth (Bi) is a semimetal with very interesting electronic properties including a long Fermi wavelength which make it a potential candidate for the observation of QSE in nanostructures. For this observation, high quality ultra-thin Bi films have to be grown on insulating or semiconducting substrates.

We present a study of the nucleation process and growth of Bi thin films on GaAs semiconductor substrates, with different orientations and doping. We show that, under dark conditions, growth potential strongly depends on the orientation (see figure). The morphology of the films also depends on the orientation.



Cyclic voltammetry and the morphology of the grown films, studied by AFM, suggest the presence of an adsorbed hydrogen layer on the substrate surface that hinders the nucleation of the film, increasing the roughness and decreasing the compactness.

In the work we also show that the width of the Bi/GaAs Schottky barrier depends on the doping of the GaAs substrates. The samples with best properties – low roughness and better orientation – have been obtained in the lowest doped GaAs substrates.