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EFFECTS OF SUBSTRATE AND THICKNESS ON THE STRUCTURAL AND ELECTRICAL PROPERTIES OF Ni THIN FILMS

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We report on the effects of the substrate and the thickness on the physical properties of Ni thin films. Ni films with thickness ranging from 170 Å to 1070 Å have been deposited thermally on Si(100) and Si(111) substrates and on glass. Rutherford backscattering spectrometry, scanning electron microscopy and X-ray diffraction experiments have been performed to study the structural properties of these samples. It is found that all Ni films evaporated on glass and on Si(100) substrates have <100> orientation. For the Ni films evaporated on Si(111) substrates, a change of texture from <100> to <111> is observed as the film thickness increases. The lattice constant and grain size are discussed as a function of substrate and thickness. Electrical properties have been also studied using the four point method. All these results will be correlated and discussed.

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