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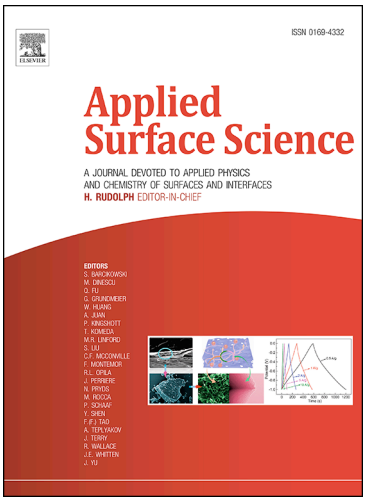

Full Length Article

Dissolution of Thin TaV_2 during Annealing of $Ta/TaV_2/V$ Tri-layer below the Order-Disorder Temperature

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Dissolution of Thin TaV_2 during Annealing of $Ta/TaV_2/V$ Tri-layer below the Order-Disorder Temperature

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Abstract

In this research, we provide first experimental evidence on the dissolution of a thin compound layer sandwiched between the parent materials when it is heated below the order-disorder temperature. The Ta(10nm)/TaV_2(6nm)/V(30nm) system, prepared by DC magnetron sputtering, has been chosen to prove the expected simulation results. The samples were investigated mainly by secondary neutral mass spectrometry. The about 6nm thick TaV_2 compound layer was dissolved by annealing at 1025 ^oC for 1 hour. Then, it was reformed by increasing the annealing time to 2-3 hours. These results prove our previous computer kinetic Monte Carlo and Kinetic mean field calculations. These findings are important for nanotechnologies utilizing early stages of solid state reactions.

Keywords

Nano diffusion; Solid state reactions; Thin films; Compound dissolution.