合金組成比を任意に制御出来る低温・高速スパッタ装置の開発研究

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Development of new method to control composition ratio of alloy film by low temperature, high rate deposition

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Research Abstract

We proposed a new method to control a composition ratio of alloy film by a improved compressed magnetic field magnerton sputtering.This magnetron sputtering source has two magnetic coils, one is a conventional magnetron coil behind the target (Bm) and the other is a compressing coil Bc to increase magnetic field parallel to the target surface. The Bm and Bc can control the spatial position of intense plasma on the target surface. If there were different kinds of rargets on the cathode, it is psssible to control the etched area of the target. Therefore, it is possible to control the composition ratio of the

sputtered films by changing the Bc and Bm.
We applied this method to fabricate super-lattice structure and graded composition film to redeuce the residual stress of the Si/TiSi_x films after thermal annealing. The thickness of one layer of our super-lattice is 35-70 .In order to get a sharp profile between layers, the precleaning of the target is important. The halfwidth of X-ray diffracted patterns of the samples are between 0.038° and 0.068° . though this superlattice was effective to reduce the residual stress, the resistivity of the film was not low enough.Then,a 0.1 m linearly graded composition layer was fabricated between 0.3 m TiSi_2 and 0.5 m Si layers. It was succeeded to deposit a stress free low resistivity film.

Research Products (11 results)

All | Other

All | Publications (11 results)

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