T19-442

Tohoku University's Invention

Film formation apparatus and method

Possible to create semiconductor (MoS_2) by friction

Able to control the film thickness and number of layers

Summary

In comparison to a method called chemical vapor deposition (CVD), one of the simple semiconductive film formation method is to create it on the surface of a substrate by friction against a pressing body where a specified solution is supplied between the pressing body and the substrate. This method is easier to form a film than the CVD method and there is a possibility to vary the characteristics of the film depending on the thickness and the number of layers of the formed film. However, there is no method to control the film thickness or the number of layers by using the conventional film formation process.

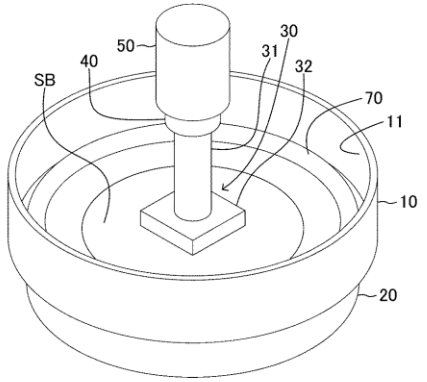
This invention provides a film forming apparatus and method capable to control the film thickness and number of layers by solving above challenges. The deposition system is provided with an energization, a drive and a control unit. The pressing body or the substrate is actuated in order to press each other, then the pressing body or the substrate is driven so that the friction is generated, and the physical quantity representing the state of friction is controlled.

Effect

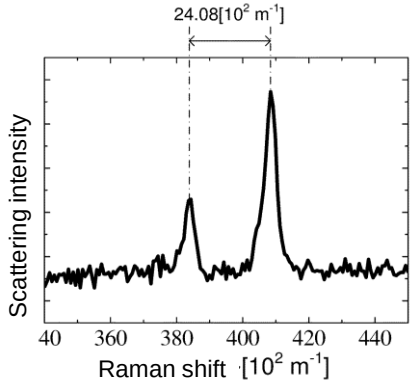
Able to form a MoS_2 semiconductive film with a predetermined thickness and number of layers by controlling physical quantity of the friction

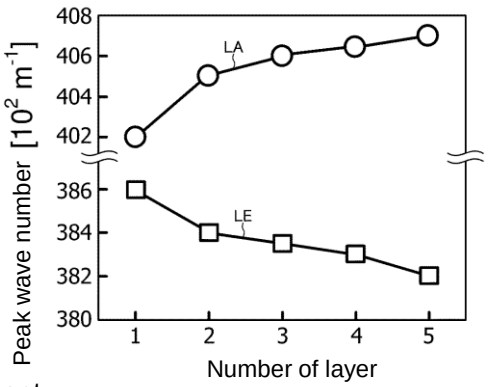
Application

●Novel deposition method for semiconductor



10.Support 11.Hole 20.Drive 30.Pressing body 31.Shaft 32.Main body 40.Detecting part 50. Energization 70.Heating SB.Substrate





【Up left】Film formation apparatus structure
【Up right】Relation between the change in scattering intensity of the formed film the the wave number representing the Raman shift.
【Down left】Relation between the peak wavenumber and the number of layers of the membrane

Patent Data Sheet

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