Agilent G200 Nanoindentation System

System Overview

In a nanoindentation experiment, stress is applied to a small volume of material to initiate a deformation. The force and displacement response are monitored simultaneously with accuracy down to micro Newton and nanometer range, respectively. This technique is extremely useful in probing properties of micro or sub-micron features, such as thin films, individual phases in multi-phase structures and nano-composites, which are nearly impossible to be assessed by conventional mechanical techniques.

- Load is controlled by an electro-magnetic coil on top of the indenter column.
- In response to the applied load, the movement of the indenter shaft is recorded by the capacitive gauge.
- The resolution of load and displacement can achieve 0.1μN and 0.1nm, respectively.

System options

- Basic indentation function (up to 10N)
- Scratch option
- Heating stage (room temperature to 350 °C)
- NanoVision imaging
- Liquid cell

Properties Measurable From Indentation Test

- Hardness
- Elastic modulus
- Creep stress exponent
- Apparent activation energy
- Loss modulus
- Storage modulus
- Friction coefficient
- Fracture toughness

Indentation on eutectic SnBi solder alloy showing an inverted triangular pyramid on sample surface. Plastic deformation and phase boundary sliding are produced due to indentation force.

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