

Method and apparatus for producing aluminum nitride wire

Suitable for thermally conductive filler and high-strength filler of sealing resin

Summary

Aluminum nitride (AlN) is known to be used as a filler in the sealing resin of electronic components and semiconductors to efficiently dissipate the heat due to its high insulation and thermal conductivity. AlN particles are manufactured at high temperatures, but the conventional method can not include a large amount of AlN particles in the resin. In recent years, the improvement of sealing resin strength is required since the demands for miniaturization of electronic components and semiconductors are increasing.

This invention can simply provide a new form of AlN that can be suitably used as a thermally conductive filler and a high strength filler. This invention is characterized by the process of mixing the carbon and alumina particles in a crucible then to achieve a mixture ratio more important than the stoichiometric mixture ratio required to produce AlN, and irradiating the alumina particles with microwaves under a nitrogen atmosphere to reduce and nitride the alumina particles with carbon particles. This invention describes also the process of sublimating the AlN and attaching it to a sample in a non-heated state to produce an AlN wire.

Effect

New AlNs suitable for thermally conductive fillers and high strength fillers usage

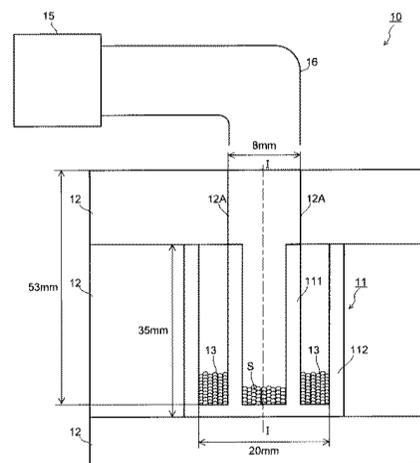
Application

- Electronic components and semiconductor devices

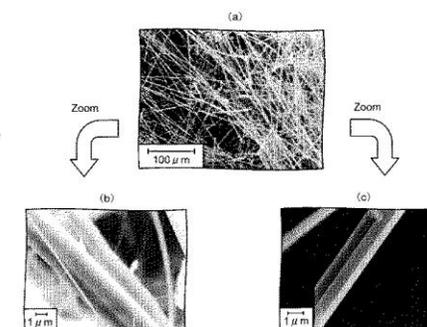
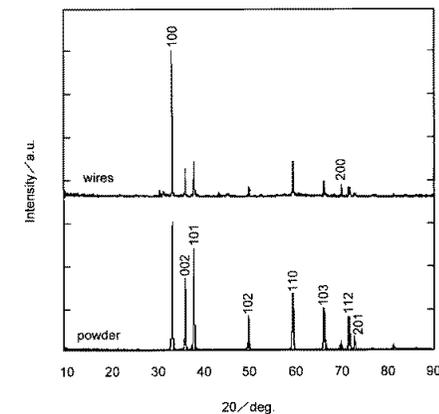
Patent Data Sheet

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10. Aluminum nitride wire manufacturing equipment 11. Crucible 111. Inner crucible 112. Outer crucible 13. Microwave absorber 14. Quartz wool 15. Microwave irradiator 16. Conduit 18. Cover



【Up left】 Diagram of the equipment for manufacturing aluminum nitride particles
 【Up right】 XRD measurement results of aluminum nitride wires
 【Down right】 SEM picture of aluminum nitride wire

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