

# Low melting point alloy solder

Solder material for precious metal restoration that melts at less than 1000°C by using the melting-point-depression phenomenon of nanoparticle

## Overview

Now, as a method of repairing scratch and crack on precious metal jewelry, a solder material made of alloy is placed on the defect area where solder is thermally melted. Precious metal exhibits a variety of colors depending on their alloy composition, so it is necessary to use a solder material with an alloy composition similar to that of precious metal ingot to ensure that color does not change. Precious metal exhibits a variety of colors depending on their alloy composition, so it is necessary to use a solder material with an alloy composition similar to the precious metal base metal for restoration to keep color. The current restoration method requires manual work using a burner at 1300 to 2500°C to melt the alloy solder, which causes thermal damage to jewelry.

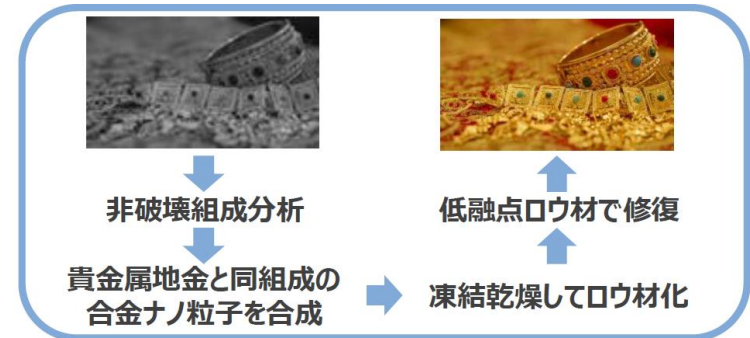
This invention is about a method for low temperature restoration of precious metal and its soldering material, which enables melting at low temperature without requiring skill. Since this solder material is mainly composed of alloy nanoparticles of few nm, it can be melted without using a burner at over 1000°C due to melting-point-depression phenomenon of metal nanoparticles. Nanoparticles are synthesized using a unique method called laser induced nucleation. This method can synthesize solid solution alloy nanoparticles of any composition (average particle diameter under 10 nm) by laser irradiation, thus creating a solder material of same composition as precious metal ingot. Color does not change before and after restoration. The figure on right is a SEM image of a solder material consisting mainly of solid solution alloy nanoparticles with copper (red), palladium (blue), and gold (green) uniformly distributed within a single particle. Since the particle size is under 10 nm, and the solder is actually melting at a temperature much lower than 500 °C.

## Product Application

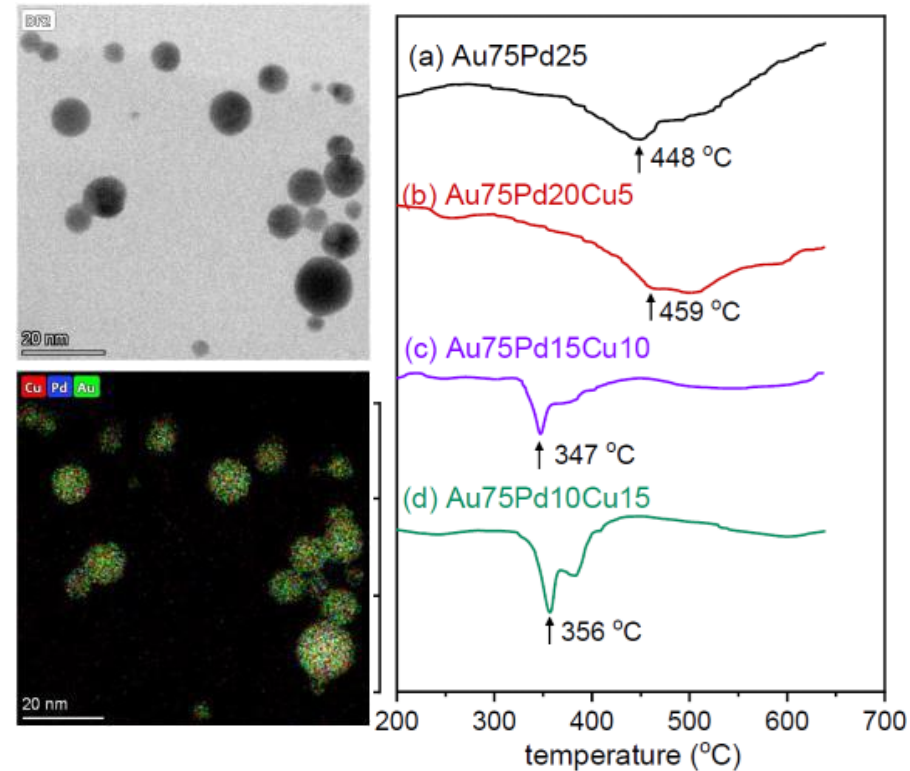
- Soldering material for restoration, especially for one of a kind object precious metal such as cultural property and antique
- Precious metal restoration contracted service for above

## IP Data

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## SEM image of solder material and melting point measurement result by DSC



## Contact

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