

Nanopartz Gold Nanowire Storage and Handling

STORAGE

Nanopartz Gold Nanowires (GNWs) can be stored at room temperature. Once opened, it is highly recommended to store them at 4C. Do not let the product freeze. This results in irreversible aggregation of the nanowires. The solution will appear clear after freezing. The shelf life of *Nanopartz* products is six months.

Light has also not been seen to degrade the quality of the nanoparticles. We have exposed the particles to high solar and UV (found in ambient sunlight) for weeks at a time with no ill effects.

HANDLING

Nanopartz GNWs have a very high surface reactivity which provides significant benefits. This sensitivity also requires greater care in handling as the nanoparticles are very sensitive to rubber, metals, dust and other impurities. The containers used for *Nanopartz* nanoparticles are polyvinyl chloride, polyethylene, HDPE narrow-mouth bottles, or glass vials with Teflon lined caps. The cleanliness of any container used for storage is extremely critical for the stability and shelf life of the gold colloid. Consequently, all pipettes or other glassware used to handle the nanoparticles must be thoroughly cleaned. Other containers used to store the nanoparticles must be cleaned using the following procedure:

1. Rinse containers with tap water. Fill containers with water and mix in a couple drops of Micro-90. Sonicate for at least 5-15 minutes.
2. Wash containers and caps with lab brushes thoroughly.
3. Rinse DI until soap residue is completely removed. Rinse containers with DI water three to four times.
4. Hang containers on bottle rack with opening down until container is completely dry.

SEDIMENTING

GNWs are large and will sediment quickly. Simple shaking and sonication will resuspend the GNWs.

Hexadecyltrimethyl ammonium bromide (CTAB) - CTAB is used as the capping agent for the nanowires. A large concentration is used in the solution to keep the nanowires from aggregating and "knotting." At colder temperatures, the CTAB capping agent in the supernatant may produce a clouding effect. This clouding effect will not affect the performance of the nanowires.

PURIFICATION

Many customer want to drop cast nanowires onto optical slides and notice a haze, with crystal formation, upon drying. This is due to the CTAB. Although Nanopartz offers GNWs with polymers to replace the CTAB that may be used in solvents, customers can choose to reduce the CTAB in the solution through centrifugation.

1. Heat only the amount that will be used that day. By removing the CTAB in the solution, the wires will begin to aggregate within minutes to hours. Heat in a water bath to 30C until the CTAB goes into solution and appear clear.
2. Put into a microcentrifuge tube and vortex at 1000 rpm for 5 minutes.
3. Remove the supernatant and refill with DI water. To concentrate the nanowires, do not refill.
4. Drop cast onto the optical slide.

Though a dark field microscope is recommended, most nanowires are visible under a brightfield microscope at 40-100x objectives.