

## 金コート銀ナノワイヤーTERS プローブ

## Au-coating Silver Nanowire based TERS probe

## How high EF and long lifetime can we get?

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Tip-enhanced Raman scattering (TERS) microscopy is a unique technique to investigate surface at the nanoscale thanks to its excellent properties, such as label-free functionality, non-invasiveness, and the ability to simultaneously provide topographic and chemical information. The probe plays a crucial role in TERS technique performance. Widely used AFM-TERS probes fabricated with metal deposition suffer from relatively low reproductivity as well as their limited lifetime. To solve the issue, we have developed silver nanowire (AgNW)-based TERS probes [1,2,3,4], which can achieve high TERS performance with excellent probe reproductivity but still presenting short lifetime due to oxidation. In this work, a simple Au coating method is proposed to overcome the lifetime issue. The TERS performance was evaluated in terms of change in enhancement factor (EF) and signal-to-noise ratio through multiple mappings and the storage lifetime in air as function of measurement time/day. The Au-coated AgNWs exhibited higher EF than pristine AgNW. Furthermore, the Au-coated AgNW probes were found to possess a longer storage lifetime in air, allowing for long and multiple TERS mappings with one single probe.

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