WO~: Preparation and Application of SERS Substrate Materials

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Purpose: Surface-Enhanced Raman Spectroscopy (SERS) is a sensitive detection and analysis technique which can detect chemical and biomolecules speedily, its detection speed is only 45 minutes. Conventional SERS substrate materials usually are noble metals, but they but they have high cost and poor uniformity, Therefore, we want to synthesize an inexpensive and uniform material Procedure: we used pulsed laser deposition method to prepare WOx nano materials with oxygen defects as substrate materials for SERS Results and Performance: It is found that this substrate can dramatically enhance the Raman signal of rhodamine 6G molecule (R6G), and its detection limit can reach 1×10^-8M, which is much lower than most semiconductor SERS substrate materials. In addition, the entire substrate material has excellent uniformity and reproducibility, and after 5 months of placement, the substrate shows good stability with minor change in overall SERS performance. Based on these excellent properties, the price cost of our materials are 50 times cheaper than noble metals of the same amount. Conclusions: This discovery not only provides a novel material applicable for food safety and other fields, but also provides a potential application in virus detection.

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