Surface-enhanced Raman scattering of R6G dimerization during self-healing of gel

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Abstract: Traditional surface-enhanced Raman scattering (SERS) substrates seeking uniformity and reproducibility of the Raman signal often assume and require that hot spots remain consistently stable during Raman testing. Recently, the non-uniform accumulation in SERS sample pre-concentration strategies have inspired the direct use of self-healing noble metal aerogels (NMAs), as the sample pretreatment presented in this work, and uncovered more diverse Raman information of substances

during the dynamic process of laser irradiation. Rare characteristic peaks such as 820 $cm^{-}1$ for R6G within a specific concentration range were observed, and potential processes including R6G dimerization and desorption were analyzed. These results provide insights into how to obtain more Raman information of diverse molecule forms under conventional conditions to distinguish the aggregation state, which turn the blinking of signals at low concentration or single molecule level into useful information.

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