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Gap-mode enhanced Raman scattering of organic monolayers on flat Au(111) surface KATSUYOSHI IKEDA, NORIHIRO FUJIMOTO, KOHEI UOSAKI, HOKKAIDO UNIVERSITY TEAM — A metal-molecular junction is recognized as a fundamental issue of molecular-based nano-devices. Charge transport through organic layers is strongly affected by chemical and physical properties of metal-molecular interfaces. In order to investigate molecular structures adsorbed on metal surfaces, surface-enhanced Raman scattering (SERS) is widely utilized as a powerful spectroscopic tool. Because of the electromagnetic origin of SERS, however, conventional SERS spectroscopy is applicable only for "rough" metal surfaces. Since various adsorption sites are exposed on rough metal surfaces, it is difficult to obtain intrinsic information of metal-molecular junctions. Here, we provide a simple method of enhanced Raman spectroscopy for organic monolayers on "flat" metal surfaces based on gap-mode plasmon excitation. The gap-mode enhanced Raman spectra measured on "flat" Au(111) single crystal facets were compared with conventional SERS spectra, and adsorption site dependence of molecular structures was discussed.

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