# グリシン/Cu(111)テンプレートにより作製した孤立フラーレン分子構造の解析と制御

**Analysis and Manipulation of Isolated Fullerene Molecules Stably Assembled on a Glycine /Cu(111) Template Structure**

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The self-assembly of molecular species on single crystal surfaces offers a promising way for creating highly ordered structures, such as well-defined 2D porous networks. Assemblies in such regular and open networks are interesting for templating guest atoms or molecules, which can be used for the construction of molecule-scale devices. $C_{60}$ molecules are so mobile on metal surfaces and can easily diffuse towards the step edges at low coverage. Therefore it is difficult to obtain isolated $C_{60}$ molecular structures. In order to overcome such problem, in this work, we first prepare a 2D glycine-based supramolecular self-assembly structure on a single crystal Cu(111) surface, which featuring a porous network structure. We then codeposite $C_{60}$ molecules on the glycine network. Interestingly, we found a site-selective adsorption of fullerene within these 2D surface nanocavities.

Figure a) shows a d$I$/d$V$ image of $C_{60}$ molecules adsorbed on glycine/Cu surface with small coverage (< 0.2 ML) observed at 5 K. On the glycine molecular structures, $C_{60}$ molecules exclusively adsorbed in the glycine nanomesh or the areas surrounded by molecular boundaries. This suggests that an enhanced diffusion barrier formed by glycine molecules. Apparently, the $C_{60}$ molecules have two different states of adsorption. We have successfully manipulated a single $C_{60}$ molecular state from one (B:brighter) state to another (D:darker) at 5 K by using STM tunneling electrons, as shown in Fig. b) and c).

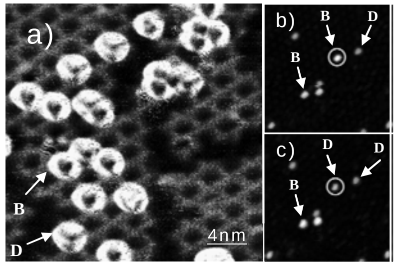


Fig.1(a) d$I$/d$V$ image of $C_{60}$ (Vs = -1.5 V). (b and c) STM images of energetic excitation for an individual $C_{60}$ molecule: b) before and c) after excitation.