

All-inorganic 1-D networking formed by self-assembly of gold tipped nanorods in the large scale

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Anisotropy of CdSe nanorods gives them reactivity at tips due to relatively loose density of ligands. Thus, when gold precursor added, gold particles are selectively deposited at both tips. Gold tips enhance the reactivity and applied possibilities of the gold tipped CdSe nanorods; for example, photocatalyst, electrical contact point, biosensor and so on.

Herein, We suggest the application to the large-scaled electrical channel, which is challenging for nano-scaled materials. In order to achieve this, we designed self-assembly of gold tipped CdSe nanorods to the large scaled network using gold tip as a linker. Additionally, through capillary force between substrate and solution, the direction of assembly is controlled in one direction. During the assembly, linking of gold tips occurs spontaneously in the same wire, resulting in the continuous and long networking. Unlike previous assembled array, this structure is perfectly continuous and made up of all inorganic materials. So, current can be flow continuously without any hopping mechanism, thus, high conductivity through overall networked wire is expected.