

## Technical Note C02: *Nanorod Crystallography*

It seems the growth of a NR takes place simultaneously in all directions. Growth in the longitudinal direction takes place parallel to the  $\{001\}$  planes, which is accompanied by formation of four relatively unstable  $\{110\}$  facets and 4  $\{111\}$  facets. Once the seed grows to a critical size, the facets become large enough for significant surfactant binding. The growth rate of different facets in the presence of the surfactant determines the final shape of the nanoparticle. The slower growth in the NR width is an example of better protection of  $\{110\}$  facets by CTAB.

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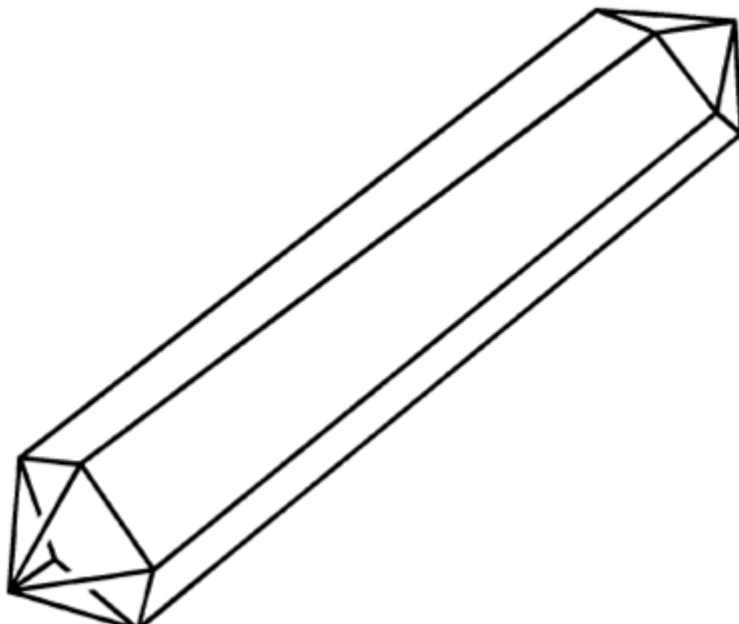


Figure 1. Cartoon of the crystallography of gold nanorods. The direction of elongation is  $[110]$ . The cross-sectional view is a pentagon; each end of the rod is capped with five triangular faces that are  $\text{Au}\{111\}$ . The sides of the rods are not as well-defined; either  $\text{Au}\{100\}$  or  $\text{Au}\{110\}$  faces, or both.