Gold nanorods using less CTAB

Gold nanoparticles nowadays are one of the most interesting tool for biomedical and technological research as they are characterized by several appealing biological and optical properties. In particular, gold nanoparticles are characterized by an intense color given by an absorption band due the oscillation of electrons on their surface that is responsible for much of the properties of gold nanoparticles. It is possible to tune the color (and thus the position of the absorption band) of gold nanoparticles by changing their shape and size. Because of their shape, gold nanorods are characterized by two absorption band one in the visible and one in the infra-red part of the spectrum. The one in the infra-red is much intense of the one in the visible and this opens the possibility to use the exciting properties of gold nanoparticles in vivo as biological tissues are almost transparent to infra-red light.

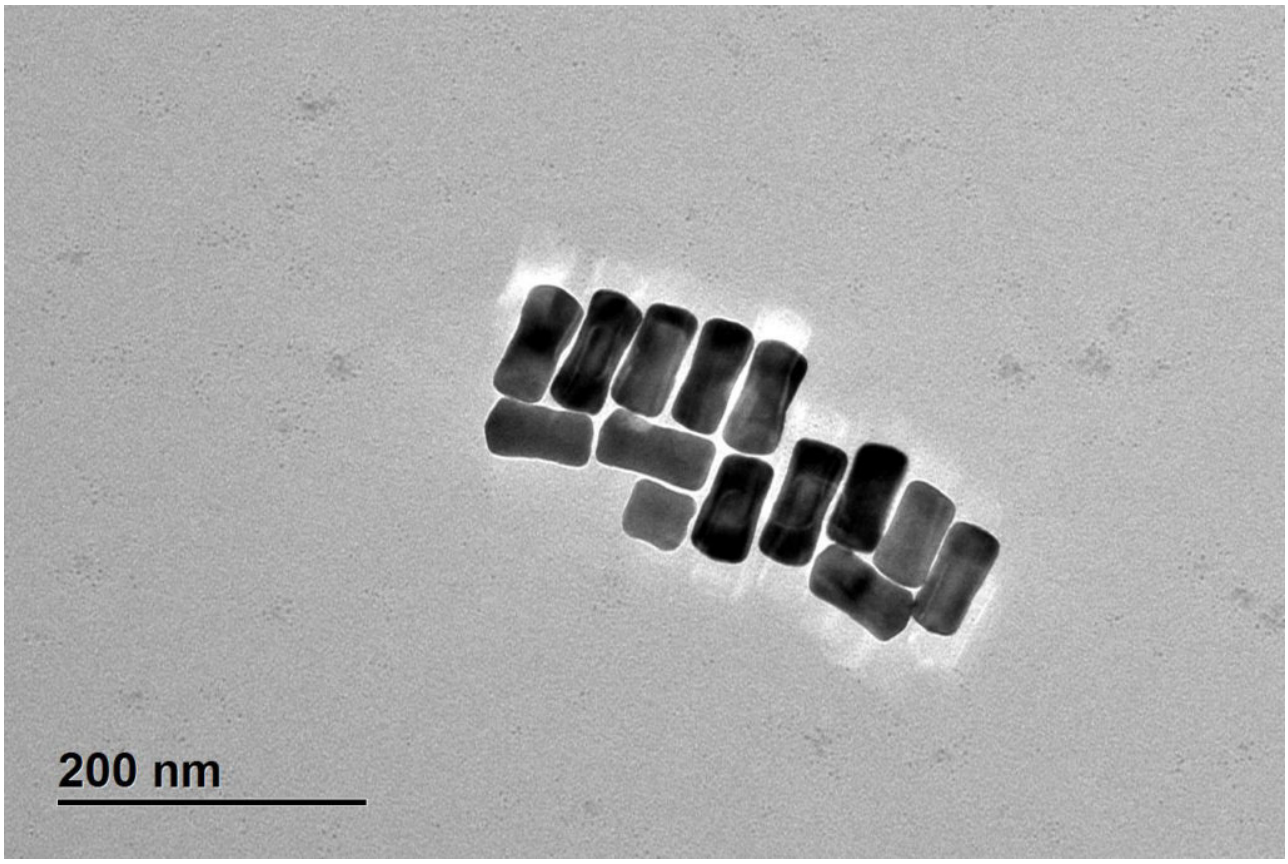

Fig. 1. TEM image of gold nanorods.

As gold nanorods becomes more popular and attract more interest, the need for a more efficient and easy to follow protocol for their preparation emerges. Current protocol for the preparation of gold nanorods is complex, not efficient and makes a large use of an expensive reagent such as

cetyltrimethylammonium bromide (CTAB). In our work we show how, by simply changing the reducing agent from ascorbic acid to hydroquinone, it is possible to obtain gold nanorods with an increased yield of about four times and using half the amount of CTAB. Besides, we showed that the size and the aspect ratio of the obtained nanorods is primarily dependent from the amount of CTAB used.

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