

# Structure sorting of single-wall carbon nanotubes

Hirokichi Kataura

Nanosystem Research Institute, AIST, Tsukuba, Japan

Contact e-mail: [h-kataura@aist.go.jp](mailto:h-kataura@aist.go.jp)

Single-wall carbon nanotube (SWCNT) is constructed from flexible  $sp^2$  network which allows variety of chiral structures. This leads to variety of physical properties using only one element. This structural flexibility can be said to be one of the most interesting properties of SWCNT. On the other hand, high-quality sample is always required for both scientific research and application development. In this case, the structural flexibility is a big problem to get high-quality sample. Most of synthesis methods failed to produce single-chirality SWCNTs. Very recently, some successful methods can produce nearly single-chirality, but the production amount is still tiny. Therefore structure sorting technique is still very important in the field of SWCNT research.

In this tutorial, I would like to discuss some typical methods of structure sorting from a historical viewing point. The mechanisms of the sorting will be also discussed focusing on the surfactant molecules that act very important role in the sorting procedure. Importantly, the surfactants have to be removed before being applied to electronic devices. This is the present target of research. I would like to introduce our latest results about large scale structure sorting and try to give a future perspective.