## Synthesizing the carbon nanotube fibers with controlling the ratio of precursors



The carbon nanotube (CNT) known as powerful material with high strength & conductivity adapted just small industrial field like composite because of length limitation. The CNTs from massive production method has less than 5 cm length (even the longest CNT showed about 40 cm length). From early 2000s, an idea, spinning the CNTs into fiber, was appeared to break that limitation. Our method, direct spinning, is one of process which holds both synthesizing and spinning the CNTs in one step. The important part of this process is making up proper catalyst particles at top of reactor. We believe that good CNTs are grown from good catalyst particles, so we controlled ratio of carbon and catalyst precursors. The quality of CNTs was determined by various analysis methods like TEM, ramen shift, and etc.