

2nd Edition of
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Large single crystal graphene production

Graphene has phenomenal properties, such as 100X of steel's tensile strength and 100X of copper's electrical Conductivity. However, such properties depend on intact honeycomb structure of carbon atoms that may be present in natural graphite across nanometer scales of la or lc. In order to expand defects less graphite crystals to micron sizes honeycomb area about one million times, we invented a metal catalytic process to regrow graphite. By heat treatment of nickel metal to saturate carbon atoms as solute, la can be enlarged with temperature and time as shown below. In addition to expand the single crystals of regrown graphite, we also exfoliate such single crystals by a liquid injection method with high pressure NMP that contains suspended graphite through a diamond nozzle. The supersonic speed of liquid can suddenly expand graphite to fewer layers. In the meantime, the defect ridden region of the regrown graphite is removed.

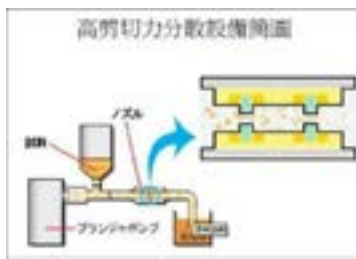


Figure 1: The average la based on Ig/I_d of Raman spectra, as an inverse function of layer spacing (d0002) as determined by XRD. By expanding single crystals of graphite and exfoliating such crystals without oxidation, we can preserve the superb properties of grapheme so many applications can be realized commercially

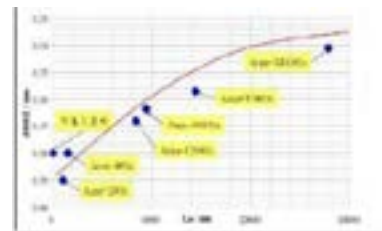


Figure 2: Insert caption to place caption below figure (Century Gothic 109)

Biography

James C Sung was responsible for diamond production technology at GE Super Abrasives, for diamond tools development at Norton. He has set the diamond grid specifications for diamond disks used worldwide for CMP of IC wafers, and helped IPO of Kink Company in Taiwan. He co-founded graphene synthetic with Huang-He worldwide, the world' largest diamond maker located in Henan China. He is now Chairman of Applied Diamond Inc., selling the most advanced CMP diamond disks-V the manufacture of next generation interconnects.

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