Nano-scale rubrene crystal with various shapes: Growth and Photo luminescence

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We report on the growth of nano-scale organic rubrene crystals by using organic vapor transport using metal catalyst, and on the photoluminescence (PL) characteristics of the system. The organic rubrene crystals were directly grown on the metal catalyst from rubrene powder through a continuously flowing N2 gas in the home-made furnace [1,2]. The metal catalysts were prepared by using e-beam lithography on the SiO2. The sizes and shapes of nano-scale rubrene crystals were dependent on the kind of catalyst, the size of catalyst, and the growth time and temperature (see Fig. 1). The formation of the rubrene nano-crystals was visualized through SEM and TEM experiments. The photoluminescence characteristics of rubrene nano-crystal were measured through the solution PL and laser confocal microscope (LCM) PL. We also present the electrical properties of the nano-scale rubrene crystals.

References
Figure 1. Organic rubrene nano-crystal with various shapes (a) ribbon, (b) tree, and (c) wire.