

Seminar Notice and Invitation

Novel Molecular Memory on Si and Two-Dimensional Materials

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Thursday, April 25, 2019, 7:00pm – 8:00pm
Engineering Building, Room 3507

Advisor: Dr. Qiliang Li

Abstract

The global next generation non-volatile memory market is 1.7 billion dollars will keep growing fast in the next decade. Explosive development of smart phone, tablet and wearable devices have driven the development of high density, high reliability and low power consumption memory. In this seminar, we will talk about development of molecular electronics in the application of non-volatile memory and work we done in this field. Recently, solid-state non-volatile memory devices based on redox-active molecules have been reported, exhibiting fast speed, low operation voltage, excellent endurance and multi-bit storage, outperforming the conventional floating-gate flash memory. I have fabricated and characterized a kind of Flash-like Ru molecular memory devices. This Ru molecular exhibit excellent memory window under high-frequency CV measurement. The programming and erasing response speed are also suitable for Flash memory applications. The stability of our molecular memory devices is demonstrated by endurance characterization for more than 10^5 cycles. The charge storage in these molecular memory devices is basically derived from the intrinsic redox processes lead by a sweeping gate voltage bias. Compare with the traditional flash memory, the intrinsic redox and the stable molecular properties lead to a very reliable and high-density charge storage ability.