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Ge-Sb-Te based phase-change nanoparticles

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Propositions accompanying the PhD thesis

Ge-Sb-Te based phase-change nanoparticles

Bin Chen

1. Nanoparticles are proper model systems for studying the down-scaling of phase-change memory.
2. Sharpening your axe fastens the work of cutting wood. The establishment of a proper model for crystallization kinetics is necessary for later research. (Chapter 3)
3. A weak dependence of the crystallization temperature on size is good for phase-change memory. (Chapter 4)
4. Heterogeneous nucleation dominates when phase-change nanoparticles become small. (Chapter 4)
5. The generalized MYEGA model describes the viscosity of the amorphous phase-change nanoparticles well. (Chapter 5)
6. In ultrafast differential scanning calorimetry an optimum heat contact existing between the whole sample and the sensor surface is of utmost importance and therefore the single flake method adopted in the present thesis is superior to the loose pile of flaky powder used in previous works. (Chapter 5 and 7)
7. Balance does not only work in life. Methane effectively improves the performance of phase-change nanoparticles but too much methane leads to their coalescence.
8. Transmission electron microscopes probe the details yet lose the large scale overview.
9. Education delivers the way of thinking rather than knowledge itself. Life is too short to pursue all knowledge. (吾生有崖而知无涯, 庄子)
10. Your assumptions are your windows on the world. Scrub them off every once in a while, or the light won't come in. (Isaac Asimov)