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Table Salt's New Application in High Throughput Growth of Zinc Oxide Nanowires from Zinc Powder JIAN YANG, Boston College, WENZHONG WANG, Boston College, YI MA, Boston College, D.Z. WANG, Boston College, ZHIFENG REN, Boston College — Table salt was found to be very helpful in producing single crystal zinc oxide (ZnO) nanowires in grams quantity with a conversion efficiency of about 60-80%. The growth process involves heating the mixture of zinc powder and table salt at about 600-700C in flowing gases of oxygen and argon. A conversion efficiency of only 5-10% was achieved when salt was not used. The salt was completely removed by a few times water rinse. The as-grown ZnO nanowires are about 40 – 100 nm in diameter and 5 – 10 micrometer in length, and are grown on either zinc oxide particles or on the surfaces of the table salt crystals. Transmission electron microscope studies showed that these ZnO nanowires are highly crystallized single crystals. Photoluminescence spectra of the as-grown and salt-free ZnO nanowires using excitation of 325 nm showed that the ZnO nanowires have a very strong emission in the visible frequency without any emission from the band edge, meaning that surface states dominate the emission. The important role of the salt plays in the high conversion efficiency is discussed.

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