

Abstract Submitted
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Magnetic and Structural Properties of Magnetite in Radular Teeth of Chiton *Acanthochiton Rubrolineatus* Y.N. HAN, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100080, China, C.L. LIU, College of Chem-biology Science & Technology, YanTai University, Shandong 264005, China, L.D. YAO, Y. WANG, X.F. HAN, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100080, China — The major radular lateral teeth of Polyplacophora Chiton comprise a magnetite biomineral cap. We have investigated the structure and magnetic properties of the biomineralized magnetite crystallites in mature teeth of Chiton *Acanthochiton Rubrolineatus*. From the measurement of magnetic properties of tooth particles using SQUID magnetometry we find that the saturation magnetization and the Verwey transition temperature (T_v) are 78.4 emu/g and 105 K, respectively. An in situ examination of the structure of magnetite-bearing region within individual tooth using the high resolution TEM, together with electron diffraction (ED) pattern and energy-dispersive X-ray (EDX) analyses indicates magnetite microcrystal form electron-dense polycrystalline sheets with typical length 800 nm and width 150 nm or so. These polycrystalline sheets are arranged regularly along the longitude direction of the tooth cutting surface. Furthermore, the microcrystallites in polycrystalline sheet take on the generally good crystallinity.

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