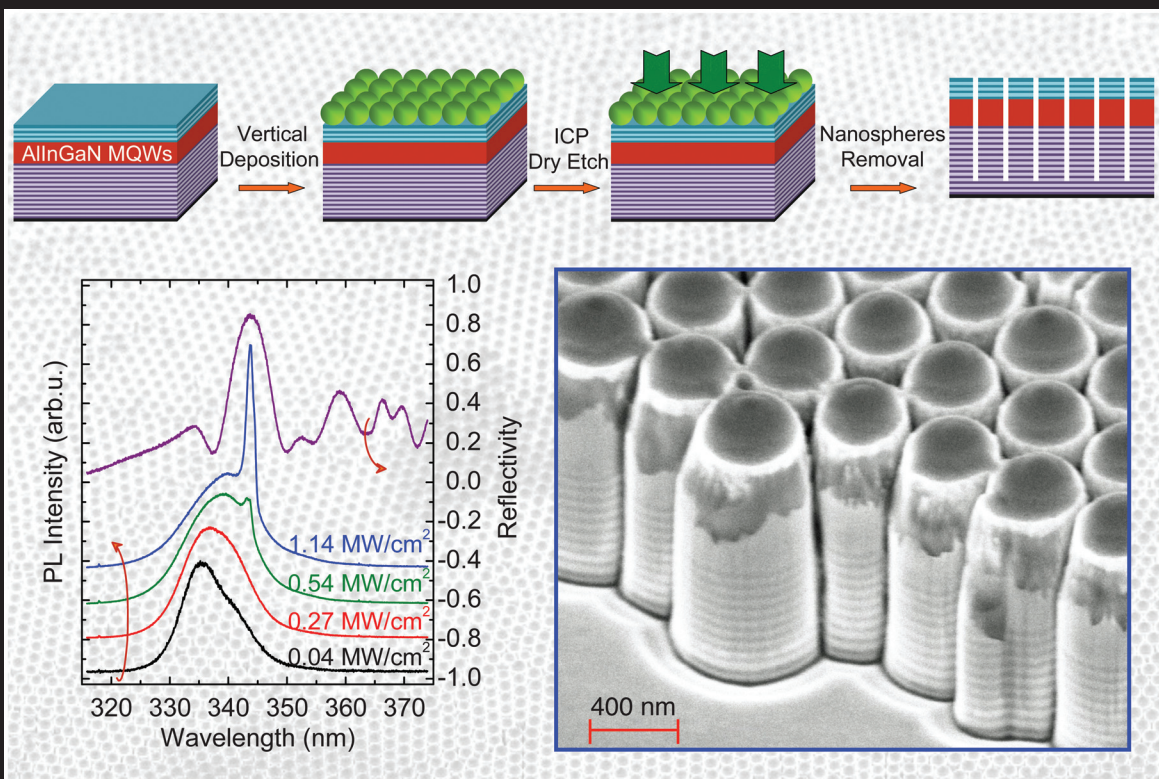


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AIP

Strong crystalline field at the Fe site and spin rotation in olivine $\text{LiNi}_{0.99}^{57}\text{Fe}_{0.01}\text{PO}_4$ material by Mössbauer spectroscopy

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The crystal structure of $\text{LiNi}_{0.99}^{57}\text{Fe}_{0.01}\text{PO}_4$ compound has been determined to be orthorhombic by Rietveld refinement method. Temperature dependence of magnetization M shows an anomalous antiferromagnetic behavior. A sudden change in both the magnitude of magnetic hyperfine field and its slope below 11 K suggests that magnetic phase transition related to the spin ordering takes place abruptly. From the result of Mössbauer measurement, it is shown that a strong electric crystalline field of octahedral symmetry including the contribution of spin-orbit coupling and magnetic hyperfine field by space-modulated spin structure is acted to the sites of Fe^{2+} ions simultaneously at low temperature. © 2010 American Institute of Physics. [doi:10.1063/1.3455312]