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Coexistence of 'Charge Order' Modulation, Tweed Microstructure and Needle Twins in La1-xCaxMnO3 (x=0.67 and 0.71) JAMES LOUDON, Cambridge University, PAUL MIDGLEY — Using transmission electron microscopy, we have observed the coexistence of two non-ferromagnetic phases in $La_{1-x}Ca_xMnO_3$ ($x = 0.67$ and 0.71) at 90 K: a modulated 'charge ordered' phase and a modulation-free region composed of needle twins. Micron-sized regions containing these needle twins formed below 170 K over 30 seconds in $La_{0.33}Ca_{0.67}MnO_3$ when cooled at a rate of ~ 0.2 K/minute. A tweed microstructure was observed in the interface region between these two phases. We estimate that the needle twins occupied less than 10% of the volume of the manganites investigated here.

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