

Figure 1: Change in transmission as a function of temperature and Nb concentration in 45nm VO<sub>2</sub> films. The T<sub>c</sub> is shifted from near ideal at 63°C to 5°C as Nb concentration is increased from 0 to 5.1 at%.

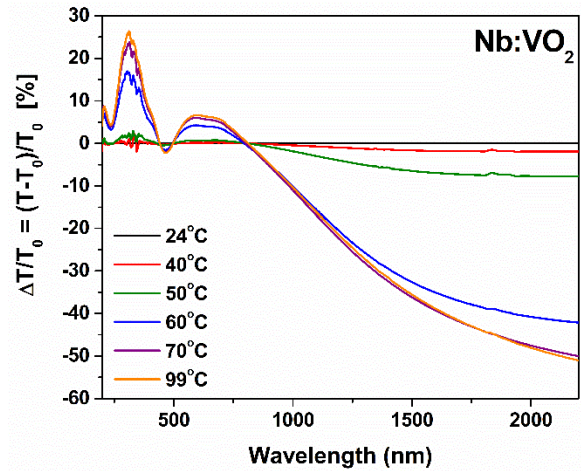
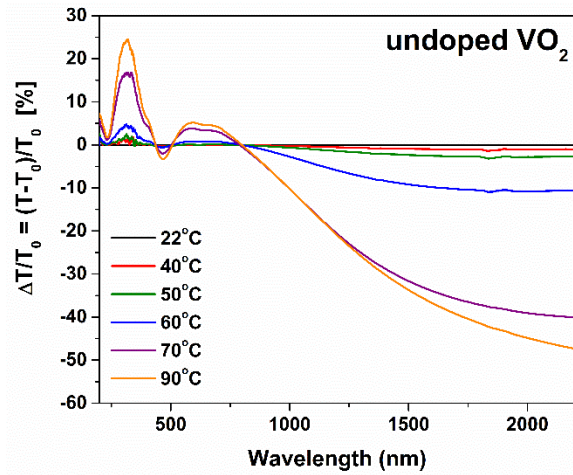


Figure 2: Comparing change in transmission as a function of wavelength for undoped VO<sub>2</sub> films and Nb-doped VO<sub>2</sub> with 1.6 at% Nb, which shows little change in modulation intensity.

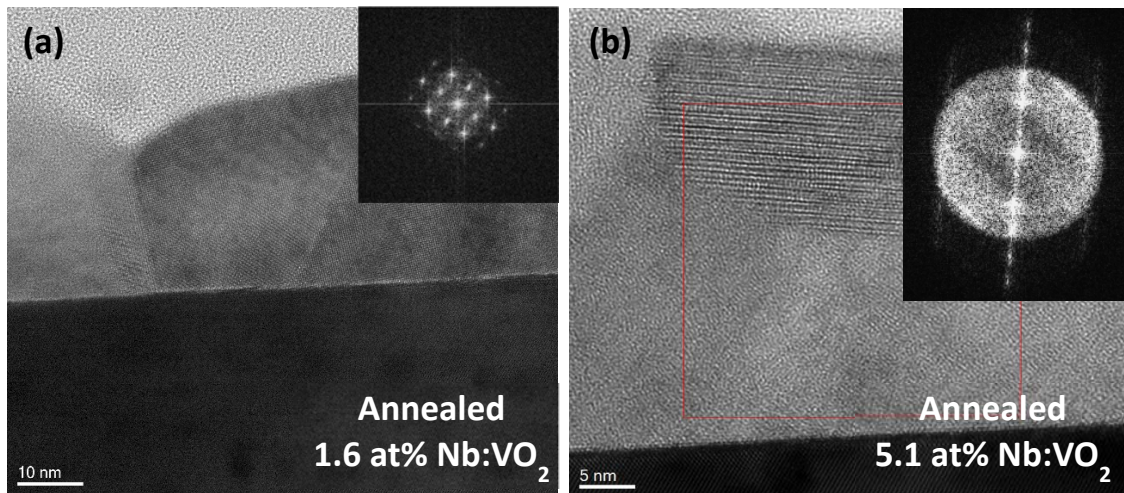


Figure 3: TEM images showing fully crystalline Nb:VO<sub>2</sub> films with similar morphology to undoped at a concentration of 1.6 at% compared to a higher doped film which shows crystalline grain surrounded by amorphous material. Both films underwent the same ex-situ anneal: 560°C for 2hr with 5x10<sup>-5</sup> Torr of O<sub>2</sub>.