**Successive pressure-induced structural transitions in monazite-type PbCrO4 and SrCrO4**

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The relationships between the crystal structure and the electronic band gap and other physical properties of PbCrO4 and SrCrO4 will be discussed. A review of recent high-pressure studies carried out in lead and strontium chromate will be presented. This will include synchrotron X-ray diffraction, Raman, optical-absorption, Hall effect, and resistivity measurements carried out up to 50 GPa using different pressure media. The discovery of several phase transitions will be discussed and the crystal structure of the high-pressure phases reported. Several high-pressure phases with structures different than the ambient-pressure monazite-type were identified in the experiments and their crystal structures determined. The changes induced by pressure in the crystal structure at the successive transitions will be correlated with changes in the Raman spectrum, resistivity, and electronic band gap. In particular, we found that in PbCrO4 the first phase transition (at 3.5 GPa) involves a band-gap collapse and a large resistivity drop associated to an increase of the carrier concentration. In the pressure range covered by the experiments, compression transforms PbCrO4 from a wide band-gap (2.3 eV) semiconductor into a narrow band gap semiconductor (0.8 eV). The reported findings provide insights into the effects of pressure on the physical properties of PbCrO4 and SrCrO4. The results will be discussed in comparison with related compounds. The distinctive role played by Pb states in the band structure of PbCrO4 and it influence in the high-pressure behavior of the band gap will be examined.