MS23-02 | Evidencing of Charge Density Wave instabilities in even members of the Monophosphate Tungsten Bronzes Family

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The MonoPhosphate Tungsten Bronzes (MPTB) family, $(PO_2)_4(WO_3)_{2m}$, can be described as a regular intergrowth of PO_4 tetraedra layers and of corner-sharing-WO_6 octaedra slabs, with a thickness depending on the *m* parameter. This family, discovered in the late 70s, was extensively studied until the end of the 90s for their potential Charge Density Wave (CDW) instabilities. According to Peierls theory, a transition toward a CDW state is characterized by an anomaly in the transport measurements accompanied by the appearance of structural modulations. Modulated structures were actually observed for all the MPTB members. However, only members with $m \leq 6$ show resistivity anomalies similar to the anomalies expected for classical CDW instabilities. These observations lead to the questioning of the nature of the structural transitions observed for the members with $m > 6$. In 2000, first MPTB modulated structures were solved, revealing the formation of tungsten clusters on the centre of the WO_3 slabs for the $m=4$ member, identified by the authors as the structural signature of the CDW. To know if this characteristic is generalizable to all the MPTB members presenting CDW states, a structural study of the $m=6$ member is proposed. A complete study, from resistivity measurements to structural resolutions, of the $m=8$ and 10 members will be then presented to evidence if their structural transitions originate from a CDW instability and if the CDW observed in the $m \leq 6$ members is preserved when the value of *m* increases.