

## **Mechanism of low temperature degradation of the Sn-based material**

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The Sn-based materials are used as a soldering material. When exposed to temperatures under 13.2. °C, they undergo phase transformation called tin pest. It is widely known process, but the actual mechanism is still not described. There are often arguments for each type and also against. The martensitic transformation seems to be less probable due to huge volume changes during the transformation. Diffusion mechanism is more likely but the transformation rate is higher than expected. Twinning might also play a role. Effect of SnO presence as a catalyzer was also described. Moreover, the transformation could be induced by inoculation by alpha-Sn (low temperature modification, also known as grey tin, diamond like structure) and some other materials.

In this work, the pure Sn was studied as well as model Sn-based alloys. The materials were studied by LM, SEM, TEM, XRF and XRD. The results will be compared and discussed with various results described in articles over approximately hundred years of scientific tin-pest description.

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