

## **Metrological Assessment of Impurity Influence on Melting and Freezing Temperature of Pure Metals**

Radek Strnad<sup>C, S</sup>

*Thermal units department, Czech Metrology Institute, Prague, Czech Republic, Czech Republic  
rstrnad@cmi.cz*

Jiří Tesař

*Fundamental metrology, Czech Metrology Institute, Prague, Czech Republic, Czech Republic*

This work is done in frame of EMRP project SIB10 NOTED “Novel techniques for traceable temperature dissemination”. One activity of this project is improving the current realisation of the international temperature scale (ITS-90) by a systematic study of the uncertainties in the realization of the defining fixed points due to impurities in the fixed point materials. Phase diagrams for low impurities concentration in the fixed point material do not currently exist, so it is not possible to perform any corrections due to impurities in the fixed point temperatures. Work aims to precisely quantify the temperature effect of some common impurities in the defining metal fixed points (gallium and aluminum). The uncertainties due to impurities correspond, on average, to about 20 % of the total uncertainty. In this paper will be presented the results of doping experiments in Ga and Al cells with Pb and Ni at 2 different concentrations obtaining their corresponding phase diagrams. Second part of the paper will deal with a metrological assessment of melting and freezing plateau and give the uncertainty estimation of these measurements.