

# **Study on the Characteristics of Metal-Carbon Fixed-Point Systems Using Differential Scanning Calorimetry (DSC)**

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It is well known that metal-carbon systems are very useful as a secondary fixed-point in temperature scales. The melting temperature of the eutectic point in Fe-C, Co-C, and Pd-C binary systems is normally used. Recently, the metal carbide-carbon peritectic point has also been studied at high temperature. To find out which system is feasible for a proper temperature-defining fixed-point, it is common to make a graphite-cell and realize it with a temperature-measuring instrument. Thus it takes long time and great efforts and the cost is very high. In this work, we would like to present an effective method to investigate the possibility of a metal-carbon system for the temperature fixed-point using DSC (differential scanning calorimetry). The repeatability of melting and freezing temperatures of eutectic or peritectic reaction can be easily evaluated. Also it is very useful to find out the dependence of the phase transition temperature on the heating and cooling rate. We will present some results on several metal-carbon systems such as Fe-C, Co-C and unreported ones in the early literature.