INTRODUCTION

Several theories proposing to mathematically describe the melting process have been developed. The validity of these theories, additional corrective information, or evidence of their error in predicting melting curves may be obtained from experimentally obtained fusion curves of the elements. This particular thesis has been undertaken to supply additional experimental data towards obtaining more complete and accurate theories of melting.

Prominent among theories on melting is an equation due to Simon[1]. He approached the problem through the methods of low-temperature physics and developed, somewhat empirically, the following equation:

$$\log (P + a) = c \log T + b$$

T is the melting temperature at the pressure P. The constants a, b, and c depend on the nature of the material. The constant b is evaluated by letting T_o be the melting temperature when P equals zero. (P equals 1 atmosphere which is approximately zero when compared to the several thousand atmospheres with which we will be dealing.) Then Simon's equation becomes:

$$P/a = (T/T_o)^c - 1$$

In this equation a is the internal pressure of the crystal due to lattice forces only (independent of the external pressure). The constant c has no particular physical significance.