HW#2 | 5.6

According to the Clausius-Claiperon equation along the melting curve:

$$\frac{dp}{dT} = \frac{q}{T\Delta V} \quad ; \quad q = T(S_{liq} - S_{sol})$$

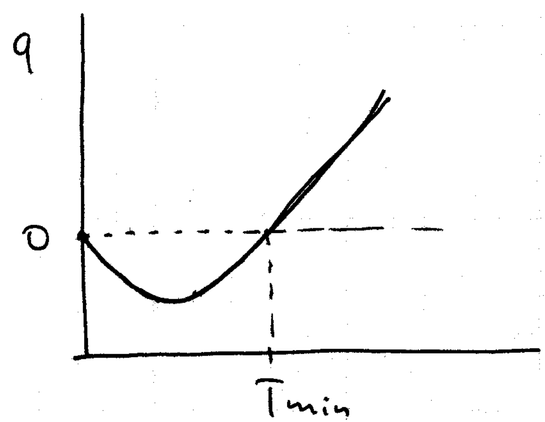
where ΔV is the change in the molar volume during melting.

At the minimum of the melting curve, we have $q=0$. From the data for the entropy of both phases, the temperature in this minimum is:

$$\underline{T_{min} = T_0 \ln 2 \simeq 0.15\,K}$$

The melting latent heat is described by a parabola, which passes through zero when $T = T_{min}$.

More specific: $q = R\frac{T^2}{T_0} - RT\ln 2$



If $T < T_{min} \Rightarrow \underline{q < 0}$!!!
(a.k.a. Pomerandшk effect)

Integrating the C.-C. equation gives:

$$p(T) = p_{min} + \frac{RT_0}{2\Delta V}\left(\frac{T}{T_0} - \ln 2\right)^2 \Rightarrow \underline{p(0) \simeq 32.5\,atm.}$$