

Abstract Submitted  
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**Theoretical melt curves of Al, Cu, Ta and Pb** SHAILESH MEHTA,  
AWE Aldermaston — The melt curves of Al, Cu, Ta and Pb are computed using simple but physically meaningful models of the solid and liquid phases in conjunction with a minimal amount of experimental data. The thermal ionic contribution to the Helmholtz free energy of the solid phase is modelled using a mean field approximation. The cold curve is obtained by iteratively determining the parameters of common analytic expressions for this quantity so that key properties of the solid are reproduced at RTP. The free energy of the ions in the liquid phase is evaluated using a modified CRIS model. By correcting the liquid free energy to reproduce experimental measurements of various melt quantities at atmospheric pressure, it is found that the melt curve remains in reasonable agreement with experiment and more advanced theoretical calculations to high pressure.

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