5 Conclusions

Whilst fully definitive statements are not available at this juncture, it appears that the results obtained to date support the following conclusions, namely:

(1) The D-values with the 'raw' g-jitter of MIR (corresponding to MIM latched) are similar to those obtained in similar alloy diffusion couples in 1992 on STS-47 and 52. Thus as far as liquid diffusion in narrow capillaries is concerned, both space vehicles provide similar reduced gravity environments.

(2) The D-value may be reduced markedly by reducing the gravity field from 1 g to that of the STS or MIR in low earth orbit.

(3) The reduction of g-jitter afforded by MIM, reduces the measured value of D even further, perhaps by another factor of 2 for Pb-Au and somewhat less for Pb-Ag.

(4) The experimental data obtained thus-far in the present study suggest a linear relationship between D and T.

(5) The use of a MIM on any manned space platform operating in *l*ow *e*arth *o*rbit (LEO) is essential when attempting to obtain accurate experimental values for liquid diffusion coefficients, even taking note that MIM is ineffective in isolating the experimental facility from disturbances induced by 'jitter' of less than 0.01 Hz. These more accurate D-values should permit a detailed examination of our current understanding of the structure(s) of liquid metals and semiconductors. Such an understanding should eventually permit the accurate prediction of D-values for all alloy systems, a feat only possible as a result of the judicious use of LEO processing.

6) Low frequency (0.1 Hz), small amplitude (less than 4 mg) single axis forced g-jitter does not appear to induce appreciably increased liquid transport in narrow long capillary liquid diffusion specimens.