seen as it may be masked by recrystallization or high temperature ($>0.5T_m$) rupture phenomena.

CONCLUSIONS

1. The brittle-to-ductile transition pressure for pure (99.999 per cent) bismuth is approximately $6.5 \times 10^8 N/m^2$ (6.5 kb) and is a sharp rather than gradual transition. The transition is sensitive to grain size, with the transition pressure increasing with the grain size.

2. Fracture in pure bismuth occurs by transgranular cleavage, and is nucleated at the intersection of twins and grain boundaries.

3. The effect of a superimposed hydrostatic pressure is to suppress fracture propagation, and enhance the operation of mechanisms of deformation (i.e. slip and twinning) and ductile fracture.

4. The low ductility of Sn–Bi alloys having a small volume fraction of Bi is due to fracture nucleating by the separation of the Sn matrix from the Bi particles situated along the grain boundaries and propagating crystallographic planes. The ductility of hypereutectic Sn–Bi alloys is controlled by the fracture behavior of primary bismuth.

5. The brittle-to-ductile transition of Sn–Bi alloys exposed to a range of superimposed hydrostatic pressures is a logical consequence of a temperature induced brittle-to-ductile transition.

ACKNOWLEDGEMENTS

The authors would like to acknowledge financial support of this project by the Army Materials and Mechanics Research Center, and the able assistance and skill of Ms. Theresa Brassard in the metallography of the pure materials and alloys used, and Messrs. Leo MacNamara and Harry Nazarian for their aid in electron fractography and the conduct of experiments.

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