

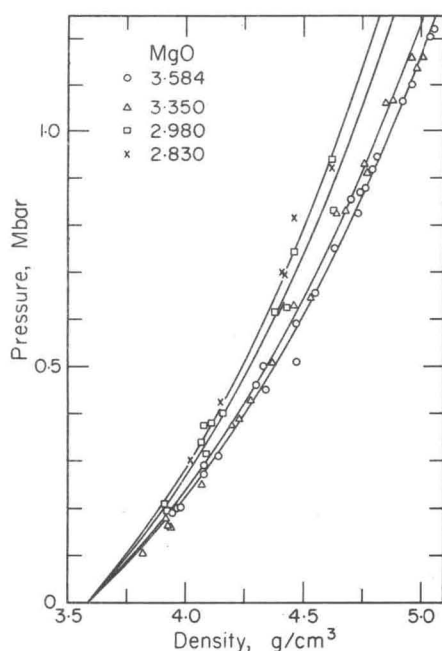


Fig. 3. Calculated MgO Hugoniot of different initial densities compared with Hugoniot data of Carter *et al.* [19]. Symbols are labelled with initial density of samples.

oped here appear to explain the available MgO Hugoniot data quite successfully. The strain parameter E appears to be more empirically successful than η .

Acknowledgements—The comments of Dr. Barclay Kamb and of the reviewer of an earlier version of this manuscript contributed to the clarification of the formula-

tion given here. This research was supported by National Science Foundation Grants GA-12703 and GA-21396.

REFERENCES

1. THOMSEN L., *J. Phys. Chem. Solids* **31**, 2003 (1970).
2. THOMSEN L., *J. Phys. Chem. Solids* **33**, 363 (1972).
3. LEIBFRIED G. and LUDWIG W., *Solid State Physics* (Edited by Bradley), Vol. 12, p. 275. Academic Press, New York (1961).
4. TRUESDELL C. and NOLL W., *Handb. Phys.* Vol. III/3. Springer, Berlin (1965).
5. MURNAGHAN F. D., *Am. J. Math.* **59**, 235 (1937).
6. DAVIES G. F., *J. Phys. Chem. Solids* **34**, 841 (1973).
7. LUDWIG W., *Springer Tracts in Modern Physics*, Vol. 43. Springer, Berlin (1967).
8. GRÜNEISEN E., *Ann. Phys. Berlin* **39**, 257 (1912).
9. BIRCH F., *Phys. Rev.* **71**, 809 (1947).
10. BIRCH F., *J. geophys. Res.* **57**, 227 (1952).
11. BIRCH F., *J. appl. Phys.* **9**, 279 (1938).
12. BASSETT W. A., TAKAHASHI T., MAO H. K. and WEAVER J. S., *J. appl. Phys.* **39**, 319 (1968).
13. DAVIES G. F., *J. geophys. Res.* **77**, 4920 (1972).
14. DEMAREST H. H. Jr., unpublished manuscript (1972).
15. AHRENS, T. J., ANDERSON DON L. and RINGWOOD A. E., *Rev. Geophys.* **7**, 667 (1969).
16. MC QUEEN R. G. MARSH S. P. and FRITZ J. N., *J. geophys. Res.* **72**, 4999 (1967).
17. BRACE W. F. and WALSH J. B., *Am. Mineral.* **46**, 1111 (1962).
18. SPETZLER H., *J. geophys. Res.* **75**, 2073 (1970).
19. CARTER W. J., MARSH S. P., FRITZ J. N. and MCQUEEN R. G., in *Accurate Characterization of the High Pressure Environment* (Edited by E. Lloyd), National Bureau of Standards Spec. Publ. 326, Washington (1971).
20. SKINNER B. J., *Am. Mineral.* **42**, 39 (1957).
21. VICTOR A. C. and DOUGLAS T. B., *J. Res. N.B.S. (U.S.)* **67A**, 325 (1963).