

A to B depends on the elastic-plastic transformation rate, while the time for stress to decay from B to C depends on the polymorphic transformation rate. To understand the rate of decay from A to C requires an understanding of both transformation processes. However, if the yielding rate is much faster than the polymorphic transformation rate, the polymorphic transformation rate is the limiting and important one. In that case, details of the yielding process are not necessary to solve most problems of interest.

Both precursor and plastic I decay data show that both transformations occur very rapidly. However, the data of Chapter 4 are not sufficient to resolve effects of the kinetics of yielding on the evolution of shocks in iron. Further, experimental and theoretical work in this area are required.

6.3. Discussion

There are some disparities in relaxation times inferred from various types of data which suggest that relaxation time is not constant. However, the relaxation times are all of the order of 0.1 μ sec. A lower bound of initial transformation rate in iron shocked to 200 kbar of 10^7 /sec can be inferred from this value of τ and Eq. (6.4).

The theoretical treatment appears adequate for data being obtained. Future work may require closer examination of its basic assumptions.