

IV. EXPERIMENTAL RESULTS AND INTERPRETATION

A. Introduction

There is very little high pressure data available on any chemical compounds initially in the liquid state. This reason, along with interest in development of liquid shot techniques and interest in the liquid state, led to the selection of benzene, carbon disulfide, and carbon tetrachloride. These liquids are readily available in quantity and at relatively high purity. All are non-polar liquids due to configurational symmetry and each has a relatively simple molecular structure.

Liquid nitrogen was included in this investigation primarily for developing experimental apparatus and techniques applicable to other liquids and solids requiring low temperatures to achieve the desired state. To evaluate these developments, the limited Russian Hugoniot work¹⁷ was available for comparison. Liquid nitrogen has the simplest molecular structure of the four liquids, being a diatomic molecule in which the two nitrogen atoms are connected by a triple covalent bond. A purity of about 99.0% was achieved with the major impurity being liquid oxygen. The boiling temperature was determined from vapor pressure tables to be 75°K at local atmospheric pressure. The density at this temperature in the non-boiling state is 0.820 g/cc. The other liquids were obtained from the Mallinckrodt Chemical Works and the General Chemical Division of the Allied Chemical and Dye Corpora-