Expt. No. 3. Pressure 24,300-25,700 atm; temp. 300 ± 5°; duration 11.5 hours. Mol. wt. of the product was 343; n_D^{20} 1.4730; bromine no. 17.7, corresponding to 38% of unsaturated hydeocarbons present in the polymer.

Examination of these exptl. results leads to the following conclusions on the effect of ultra-high pressure on the polymerization of tetramethylethylene.

1. Rate of polymerization is increased. At 200 atm pressure only about 20% of tetramethylethylene was polymerized after 50 hours; at 23,000 atm all the monomer was polymerized within three hours.

2. The degree of polymerization is increased. At 200 atm, 75% of the polymer was only the dimer, while the remaining 25% had an av mol. wt. of 248, corresponding to the trimer. At 27,000-27,500 atm the av mol. wt. of all products was about 400, despite the fact that the expt. lasted only one-eighth as long as did the expt. at 200 atm.

3. The polymers obtained at ultra-high pressures are characterized by low bromine nos., corresponding to a 33-38% content of unsaturated hydrocarbons. Polymers obtained at 200 atm pressure have bromins nos. corresponding to 100% content of unsaturated aompounds (which is true even of the fraction of highest mol. wt.).

This circumstance leads to the conclusion that, at ultra-high pressures the formation of polymers with cyclic structure occurs to some extent. Such cyclic polymers might be formed by overcoming the steric hindrance (see above) of