

PHYSICAL PROPERTIES OF HYDROGEN PEROXIDE



A majority of the physical properties of propellant-grade solutions of hydrogen peroxide have been experimentally characterized (or analytically extrapolated) with a reasonable degree of accuracy over ambient temperature ranges. However, because of the increasing decomposition rates of these propellant solutions with increase in temperature, very few measurements have been conducted above 200 F. In addition, the accuracy of data is questionable in temperature ranges where decomposition rates are relatively high. This is evident in the discontinuity of some of the data at the higher temperature ranges.

100% Hydrogen Peroxide

It should also be noted that the data reported for “pure” (or 100 w/o) H_2O_2 is questionable since there is some doubt as to the existence of H_2O_2 concentrations above 99.7 to 99.8 w/o. Some of the data reported for 100 w/o H_2O_2 were obtained by extrapolation of property data of H_2O_2 solutions of lower concentration, while other experimental measurements reported on “100 w/o” H_2O_2 indicated propellant assays of “99+ percent,” “99 ±0.5 percent,” etc. Even for most of those studies which report the H_2O_2 concentrations, the methods of determining these concentrations are not reported or are based on an assumption of purity related to the purification technique.

Although it is suspected (because of discontinuities in the data) that many of the measurements on the “100 w/o” H_2O_2 represent, in reality, measurements on H_2O_2 of lower concentrations, properties are reported for 100 w/o H_2O_2 wherever an extrapolation (from lower concentrations) seems reasonable. This characterization is of academic interest only because ~ 98 w/o H_2O_2 is

the highest concentration presently available commercially. Future aerospace industry utilization of higher concentrations appears unlikely because of practical and economical considerations.

Nominal Values of Hydrogen Peroxide

All of the data presented are direct experimental determinations or are derived from curve-fits of the experimental data, except for those data referenced with an asterisk; the data referenced with an asterisk were a result of calculations made during the referenced work and based on standard analytical correlations and physical relationships. The absence of data on a particular property is denoted by blank spaces in the tables.

Property-temperature relationships are shown in general identification of hydrogen peroxide. The graphical illustrations represent either curve-fits of the best available experimental data or analytical estimations of the property; curve-fits of experimental data are noted with a solid line, while a dashed line designates calculated data. Equations resulting from computer curve-fits of some of the data are presented in attendant discussions.

Source : <http://www.diyspaceexploration.com/physical-properties-of-hydrogen-peroxide/>