Thermal Conductivity
Experimental measurements of the thermal conductivity of H₂O₂-H₂O solutions have been limited to determinations (Ref. 3) on 98.2 w/o H₂O₂ at 0 °C (32 °F) and 25 °C (77 °F) and on 50 w/o H₂O₂ at 25 °C; resulting thermal conductivities were 0.321, 0.339, and 0.347 Btu/hr-ft-°F, respectively. Using the two experimental data points, the thermal conductivity of 98.2 w/o H₂O₂ was extrapolated to the critical point. This extrapolation, shown in Fig. 2.21, used H₂O as a reference substance and assumed no decomposition and a thermal conductivity of 0.100 Btu/hr-ft-°F at the critical point.

Coefficient of Diffusion
The experimental determination of the diffusion coefficient of liquid H₂O₂ into water has been reported (Ref. 6) for 0.17 w/o H₂O₂ from 0 to 40 °C (32 to 104 °F) and for 0.019, 1.44, and 7.92 w/o H₂O₂ at 20 °C (68 °F). At 20 °C (68 °F), the diffusion coefficients were <1.2 cm²/day for the concentrations studied. The diffusion coefficient of H₂O₂ vapor into air was experimentally determined in a vertical tube as 0.188 cm²/sec at 60 °C (140 °F) and 1-atmosphere pressure. This can be compared to a diffusion coefficient of 0.320 cm²/sec reported (Ref. 7) for water vapor under identical conditions.

Sonic Velocity
The velocity of sound was experimentally measured (Ref. 8) in H₂O₂-H₂O solutions from 3.5 to 33.5 °C (38.3 to 92.3 °F). These data are plotted for propellant-grade H₂O₂ solutions in Fig. 2.22 and 2.22a.
Figure 2.22. Velocity of Sound in Propellant-Grade Hydrogen Peroxide-Water Solutions
Figure 2.22a. Velocity of Sound in Propellant-Grade Hydrogen Peroxide-Water Solutions

Source: http://www.diyspaceexploration.com/transport-properties-of-hydrogen-peroxide/