and 114 kb for example should be $2090 \pm 500 \, cm^2 \, ohm^{-1} \, mole^{-1}$. *Figure 17*, which is from Hamann and Linton[46], gives the ionization product of water derived from static and shock wave experiments as a function of density for several temperatures. At $1000°C$ and densities between 1·5 and 1·7 $g/cm^3$ the ionization product reaches values of $10^{-2}$ to $10^{-1} \, mole^2 \, l^{-2}$. This increase of the product by more than twelve orders of magnitude over the value for standard conditions is not unreasonable if one assumes a constant energy of dissociation and an average reaction volume change for the pressure range between 7 and 10 $cm^3/mole$. It has been suggested that water may become an ionic fluid if compressed to densities higher than about 1·8 $g/cm^3$ at high supercritical temperatures[46, 47]. This plausible suggestion means that water at these conditions would behave similarly to fused sodium hydroxide. It is indicated in the upper right corner of *Figure 17*.

Recently conductance measurement with pure fluid ammonia have been made to $600°C$ and 40 kb using a similar method as in the water experiments[48]. The two broken curves in *Figure 16* give the results. It appears as if the ionization would also be increased substantially by raising temperature and pressure. The ionization product for ammonia at $500°C$ and 40 kb has been estimated from these conductance data to be $4 \times 10^{-4} \, mole^2 \, l^{-2}$. This would be an increase by about a factor of about $10^{18}$ over the value for 25°C at saturation pressure[49].



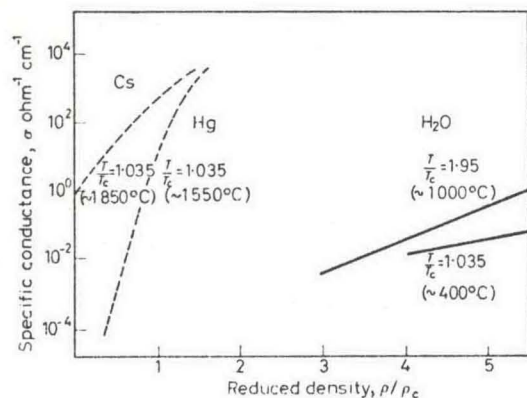*Figure 18.* Specific conductance $\sigma$ of supercritical caesium and mercury and of supercritical water as a function of reduced density $\rho/\rho_c$

As a conclusion it may be interesting to compare the electric conductance of dense supercritical water with the conductance of dense gaseous super-critical mercury[50] and caesium[51]. This is done in *Figure 18*. The logarithm of the specific conductance is plotted as a function of reduced density. The actual density is divided by the critical density of each substance. The comparison is made at a reduced temperature of 1·035—slightly above the critical point. For water, however, a second curve for a reduced temperature

of almost two is given. The difference in behaviour is very obvious. Mercury and caesium already attain a conductance of $1000 \, ohm^{-1} \, cm^{-1}$ at less than twice the critical density. This has been shown as due to electronic conduct-ance in the dense gas phase[50]. For water, as an ionic conductor, compression to more than five times the critical density and twice the critical temperature is necessary to reach a specific conductance of $1 \, ohm^{-1} \, cm^{-1}$.

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