

Marks
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- The critical point of H_2O is over $250\text{ }^\circ\text{C}$ higher than for H_2S , H_2Se and H_2Te . Describe, at the molecular level, what needs to happen to the interactions between the water molecules to reach the critical point and why this requires a higher temperature in water than in the other group 16 hydrides.

At the critical point, the gas and liquid phases are indistinguishable.

As a liquid is heated and undergoes a phase change in a closed container, the density of the liquid decreases and the density of the vapour increases. When these values are the same, there is no longer a phase boundary and a supercritical fluid has been produced.

Water has strong H-bonds, whereas H_2S , H_2Se , H_2Te have much weaker dispersion and dipole-dipole interactions. The stronger H-bonds require a higher temperature to overcome the intermolecular forces, so water has a higher critical temperature than the other Group 16 hydrides.