

Topic Page: [Waals, J. D. van der \(Johannes Diderik\), 1837–1923](https://search.credoreference.com/content/topic/van_der_waals_johannes_1837_1923)

Summary Article: **van der Waals, Johannes Diderik**

From *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*

Dutch physicist who was awarded the Nobel Prize for Physics in 1910 for his research on the gaseous and liquid states of matter.

Van der Waals set out to account for discrepancies in behaviour of real gases at high pressure when compared with that predicted theoretically by the simple gas laws. These laws assumed that gas molecules did not take up any volume and that there were no attractive forces between the molecules. Van der Waals knew these assumptions to be wrong and introduced two parameters into the kinetic theory of gases, from which he thought he could express the ideal gas law. The resulting equation was more accurate than the original had been in predicting the behaviour of gases and became known as the van der Waals' law. Knowing that each gas and corresponding liquid had its own individual properties, van der Waals further refined his work to produce an equation which could provide a complete description for the physical state of first gases and then liquids. This became known as the law of corresponding states. He extended this study to take into account the effects of different types of molecules being present. His work led to the prediction of what conditions would be necessary to convert a gas to a liquid, which allowed the liquefaction of helium, the only gas which had not been converted to a liquid at that time.

Van der Waals was born in Leiden, the Netherlands. He received his PhD in physics from the University of Leiden, the Netherlands, in 1873. He was professor of physics at the University of Amsterdam 1877–1907. The weak attractive forces between atoms or molecules were named the van der Waals forces in recognition of his contribution to science.

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