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| **Lesson Number – 20.2** |
| **Lesson Title – The ideal gas law** |
| **Specification Reference** | **3.6.2.2 / 3.6.2.3** |
| **Learning Objectives** |
| Gas laws as experimental relationships between *p*, *V*, *T* and the mass of the gas.Ideal gas equation: *pV* = *nRT* for *n* moles and *pV* = *NkT* for *N* molecules.Avogadro constant *N*A, molar gas constant *R*, Boltzmann constant *k*Molar mass and molecular mass. |
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| **Opportunities for Assessment** |
| Page 322 questions |
| **Starter:** | Slide #1 enables the students to recap and discuss the previous lesson on the gas lawsSlide #2 builds on this slightly by reaffirming what is meant by an ideal gas |
| **Main:** | Slide #3 explains Brownian motion – a demonstration of this with smoke particles is possible however it is very difficult to achieve effectivelySlides #4 to #6 explain the Avogadro constant and moles – Chemists may well have covered this but their preconceptions may be incorrectSlide #7 is animated slightly and shows how the ideal gas equation is created from the previous three laws. Higher level students should be able to do this themselvesSlides #8 and #9 go over the two forms of the formula and the respective constants *R* and *k* |
| **Plenary:** | Slide #10 is a summary of the lesson |
| **Homework:** | Page 322 questions, research and biography of Avogadro |
| **Differentiation / Extension / S&C** |
| Creation of the ideal gas laws from the basic gas laws and molecular theory |
| **Numeracy / Literacy** | **SMSC / Fundamental British Values** |
| Combining formulae to create the ideal gas law | Realisation that the full understanding of the gas laws comes from combining research and work from several scientists over decades of work. |
| **RESOURCES:** |
| None |
| **Risk Assessment** e.g. CLEAPSS card reference |
| N/A |
| **Working Scientifically (HSW)** |
| Links between Physics and Chemistry (Molecules and Avogadro constant) |