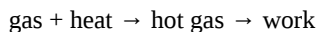


CHAPTER OVERVIEW

1: Gas Equations of State

We power our planet by heat. That energy is largely derived (at the time of this writing in the early 2020's) from either burning fossil fuels or by setting off a continuous stream of controlled nuclear explosions under water. This creates hot, pressurized gas that turns a turbine that energizes a generator. Gas powered cars aren't that much different. This is how it works, with "it" being everything that holds our society together-cheap power. Understanding how power is generated is important, and chemistry plays a significant role since we burn fuels to do it. For this book, we are going to start by understanding gases, especially hot gases, and how they create work. This will be, like, a totally lame chemical reaction:



but it has the benefit of being very easy to understand. Later we will get to the burning fuel oil part, although I hope those chapters are deleted after something better comes along. If not, then those "Mad Max" movies are going to look more like documentaries from the future, and hopefully your hunting / gathering skills are up to speed.

[1.1: Units and the Perfect Gas Law](#)

[1.2: Van der Waals Equation](#)

[1.3: The Virial Equation](#)

[1.4: Phase Transitions](#)

[1.5: Corresponding States](#)

References

Avogadro, "Essai d'une maniere de determiner les masses relatives des molecules elementaires des corps, et les proportions selon lesquelles elles entrent dans ces combinaisons" Journal de Physique, **1811**, 73, 58-76.

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