# Phlogiston

Advanced

- The phlogiston "theory" goes back to 1667 when **Johann Joachim Becher**, a chemist or better alchemist, postulated the existence of a fire-like element called "phlogiston", which was contained within combustible bodies and released during combustion. "Phlogiston" comes from ancient Greek "phlogistós" and means "burnt". The word "*caloricum*" was also used.
  - Becher tried to explain combustion in general and the corrosion or rusting of metals, something he saw (correctly) as a kind of very slow combustion.
    Things that could burn were supposed to contain some phlogiston, a substance without color, odor, taste, mass or anything else that could be measured. Phlogiston is liberated in burning. What remains after the phlogiston left the material, the dephlogisticated substance, was supposed to be the "true" form of the substance (called **calx**). Nowadays (not counting gases produced) we call that ashes or oxides.
  - Materials like (pure) coal or sulfur burnt without leaving any residues or "calx" and thus were supposed to contain a lot of phlogiston. Metal, after burning or just corroding, became "earthy, salty" calx and thus must contain less phlogiston. Gold and partially silver stay always gold and silver and thus contain no phlogiston, something supposed to be noble. Hence "**noble metals**".
    Heating things in the presence of phlogiston-rich coal could partially restore phlogiston to calxes and thus produce metals. And so on.
- The phlogiston "theory", in a way, is just the opposite of the truth. You don't add something to metal oxides during smelting with coal, you take the oxygen away
  - Nevertheless, the phlogiston "theory" enjoyed great popularity in the 17th and 18th century. It was **Robert Boyle** who planted the first seeds of doubt in his book "The Sceptical Chemist" in 1661 but nobody listened. Why am I not surprised?
    **Mikhail Lomonosov** in 1753 almost shot down the phlogiston "theory" but it was left to **Carl Wilhelm Scheele**, and **Antoine Lavoisier** to bring it down completely. The same Lavoisier, by the way, who proved that diamond is carbon. Of course a few conservatives still believed in the dead theory for many years to come.

- So how about our modern theories? Easy. I'm absolutely sure that we are right about what we claim today and that nobody will ever shoot down the "atom theory" in the future, up to the end of the universe.
  - If you wonder why modern science is absolutely sure about some basics (I'm not saying we are absolutely sure about everything), you are either stupid, clueless or a (French) philosopher.
    Well, nobody is perfect—but you might get better. Try.