Ostwald-Bauer Process Encyclopedia Article

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The invention of the Ostwald-Bauer process enhanced the ability of chemists to produce nitric acid. Nitric acid was originally synthesized by heating saltpeter with sulfuric acids. The process was first discovered by Jabir Ibn Hayyan (c.721-c.815) in the eighth century. In 1901, Russian-born German physical chemist Friedrich Wilhelm Ostwald (1853-1932) invented a much better process for manufacturing nitric acid. He won the Nobel Prize for chemistry in 1909 for his work on catalysis, and today is regarded as the one of the founders of modern physical chemistry, the branch that investigates chemical changes by observing changes in physical properties. From a commercial point of view, however, Ostwald's greatest invention and most important contribution to the fields of science and industry was the Ostwald-Bauer process.

This method employs a platinum catalyst to promote the composition of nitric acid. Ammonia became available in economical quantities before World War I started, when German chemist Fritz Haber invented a process for synthesizing the element in 1908. In Ostwald's three-step procedure, ammonia is converted into nitric oxide and then changed into nitrogen dioxide, by combining with hot air and being exposed to a piece of gauze coated with platinum and rhodium. The gases that are produced and collected are then absorbed in water, thereby creating nitric acid.

Nitric acid (HNO_3) is recognized as an important industrial chemical. It is an essential ingredient in many fertilizers, and it is used in the production of plastics, lacquers, and dyes. One of nitric acid's most important uses, however, is in the manufacture of such explosives as dynamite. In the presence of sulfuric acid, nitric acid reacts with toluene to form TNT (trinitrotoluene).