Astatine Encyclopedia Article

Astatine

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Most students of chemistry study the first four members of the halogen family-- fluorine, chlorine, bromine, and iodine --but hear little or nothing about the last member, astatine. Chemists searched long and hard for this element in nature, but without success. Finally, the element was created artificially in 1940 by D. R. Corseon, K. R. MacKenzie (b.1912), and Emilio Segrè working at the University of California at Berkeley. These scientists bombarded bismuth with alpha particles to obtain element #85. They named their discovery *astatine* (chemical symbol: At) after the Greek word for unstable, *astatos*.

Astatine is the only halogen with no stable isotopes. Of the 24 isotopes known, the two most stable have half lives of about 8 hours. Because it decays so rapidly, there may be no more than about 25 grams of the element in the Earth's crust.

Astatine appears to have the properties expected of the heaviest halogen element. It is a solid with a melting point of 302°C and an estimated boiling point of 337°C. It is more metallic than iodine and, according to some chemists, should be classified as a metalloid rather than as a non-metal. Definitive information about the element is somewhat difficult to obtain since scientists must work with samples weighing less than a microgram.

One interesting discovery is that astatine appears to behave like iodine in the human body, accumulating in the thyroid. Scientists speculate that, because it is so radioactive, the element might be used to treat hyperthyroidism. When given to a person with an overactive thyroid gland, the element may go to the thyroid and destroy some excess thyroid tissue by irradiation.