

= Rhenium =

Rhenium is a chemical element with symbol Re and atomic number 75 . It is a silvery @-@ white , heavy , third @-@ row transition metal in group 7 of the periodic table . With an estimated average concentration of 1 part per billion (ppb) , rhenium is one of the rarest elements in the Earth 's crust . The free element has the third @-@ highest melting point and highest boiling point of any element , at 5 @, @ 869 K (10 @, @ 105 ° F) . Rhenium resembles manganese and technetium chemically and is mainly obtained as a by @-@ product of the extraction and refinement of molybdenum and copper ores . Rhenium shows in its compounds a wide variety of oxidation states ranging from ? 1 to + 7 .

Discovered in 1925 , rhenium was the last stable element to be discovered . It was named after the river Rhine in Europe .

Nickel @-@ based superalloys of rhenium are used in the combustion chambers , turbine blades , and exhaust nozzles of jet engines . These alloys contain up to 6 % rhenium , making jet engine construction the largest single use for the element , with the chemical industry 's catalytic uses being next @-@ most important . Because of the low availability relative to demand , rhenium is among the most expensive of metals , with an average price of approximately US \$ 2 @, @ 750 per kilogram (US \$ 85 @. @ 53 per troy ounce) as of April 2015 ; it is also of critical strategic military importance , for its use in high performance military jet and rocket engines .

= = History = =

Rhenium (Latin : Rhenus meaning : " Rhine ") was the last @-@ discovered of the elements that have a stable isotope (other new elements discovered in nature since then , such as francium , are radioactive) . The existence of a yet @-@ undiscovered element at this position in the periodic table had been first predicted by Dmitri Mendeleev . Other calculated information was obtained by Henry Moseley in 1914 . It is generally considered to have been discovered by Walter Noddack , Ida Tacke , and Otto Berg in Germany . In 1925 they reported that they had detected the element in platinum ore and in the mineral columbite . They also found rhenium in gadolinite and molybdenite . In 1928 they were able to extract 1 g of the element by processing 660 kg of molybdenite . It was estimated in 1968 that 75 % of the rhenium metal in the United States was used for research and the development of refractory metal alloys . It took several years from that point before the superalloys became widely used .

In 1908 , Japanese chemist Masataka Ogawa announced that he had discovered the 43rd element and named it nipponium (Np) after Japan (Nippon in Japanese) . However , later analysis indicated the presence of rhenium (element 75) , not element 43 . The symbol Np was later used for the element neptunium , and the name " nihonium " , also named after Japan , has been proposed for element 113 .

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