IRON!

IRON IS A CHEMICAL ELEMENT WITH SYMBOL FE(FROM LATIN: FERRUM) AND ATOMIC NUMBER 26. IT IS A METAL THAT BELONGS TO THE FIRST TRANSITION SERIES AND GROUP 8 OF THE PERIODIC TABLE.

BIRTH

ARCHAEOLOGISTS ESTIMATE THAT PEOPLE HAVE BEEN USING IRON FOR MORE THAN 5,000 YEARS. IN FACT, IT TURNS OUT THAT SOME OF THE MOST ANCIENT IRON KNOWN TO HUMANS LITERALLY FELL FROM THE SKY. IN A STUDY PUBLISHED IN 2013 IN THE JOURNAL OF ARCHAEOLOGICAL SCIENCE, RESEARCHERS EXAMINED ANCIENT EGYPTIAN IRON BEADS THAT DATE TO AROUND 3200 B.C. AND FOUND THAT THEY WERE MADE FROM IRON METEORITES.

Usage

IRON, IN GENERAL, WAS HEAVILY USED FOR TOOLS AND WEAPONS IN THE PAST. IRON IS USED TO CREATE STEEL, OFTEN USED IN MANUFACTURING AND CIVIL ENGINEERING. STAINLESS STEEL, WHICH IS HIGHLY RESISTANT TO CORROSION, IS COMMONLY USED IN KITCHEN CUTLERY, APPLIANCES, COOKWARE AND HOSPITAL EQUIPMENTS. IT IS ALSO USED TO MAKE MACHINERY, TOOLS, VEHICLES ETC.

PHYSICAL PROPERTIES

- COLOUR: SILVER-GREY METAL
- MALLEABLE
- DUCTILE
- LUSTROUS
- GOOD CONDUCTOR OF HEAT AND ELECTRICITY
- ALLOTROPY: OCCURS IN TWO OR MORE CRYSTALLINE FORMS IN THE SAME PHYSICAL STATE
- TENSILE: CAN BE STRETCHED WITHOUT BREAKING.
- FERROMAGNETIC

POSITION

IRON IS THE 26TH ELEMENT ON THE PERIODIC TABLE. IT IS LOCATED IN PERIOD 4 AND GROUP 8.

SPECIAL COMPOUNDS

- FERROUS OXIDE
- FERRIC OXIDE
- FERROFERRIC OXIDE

UNIQUENESS

IRON IS A "SPECIAL" ELEMENT BECAUSE OF ITS NUCLEAR BINDING ENERGY. THE VERY BASIC IDEA IS THAT WHEN YOU FUSE TWO LIGHT ELEMENTS TOGETHER, YOU GET A HEAVIER ELEMENT PLUS ENERGY.

CHEMICAL PROPERTIES

- READILY COMBINES WITH OXYGEN IN MOIST AIR. THE PRODUCT OF THIS REACTION, IRON OXIDE (Fe_2O_3), IS KNOWN AS RUST.

- IRON ALSO REACTS WITH VERY HOT WATER AND STEAM TO PRODUCE HYDROGEN GAS.

ISOTOPES

IRON HAS FOUR STABLE ISOTOPES: “54 FE” (5.845% OF NATURAL IRON), “56 FE”(91.754%), “57 FE” (2.119%) AND “58 FE” (0.282%). 20-30 ARTIFICIAL ISOTOPES HAVE ALSO BEEN CREATED. RADIOACTIVE “FE 59” HAS BEEN PRODUCED THROUGH THE REACTIONS “FE 58”(D,P) “FE 59” AND “CO 59”(N, P) “FE 59”.

CORROSION

IRON OBJECTS CONSEQUENTLY REACT WITH THE OXYGEN IN THE AIR AND GET RUSTED IN A HUMID ENVIRONMENT. RUST IS IRON OXIDE. RUSTING HAPPENS ON THE SURFACE OF IRON OBJECTS MAKING IT COARSE AND FLAKY. IT ALSO MAKES THE IRON OBJECTS FRAGILE. RUSTING HAPPENS QUICKER IN A HUMID ENVIRONMENT. AS A RESULT, IT IS EASIER FOR WATER TANKS AND PIPES TO GET RUSTED. THEREFORE, VARIOUS METHODS ARE USED TO REDUCE THE EFFECT OF RUSTING. GETTING WOUNDED FROM A CORRODED METAL OBJECT ESPECIALLY RUSTED IRON OBJECTS CAN PROVE TO BE DANGEROUS.