

University Hamma Lakhdar of El Oued,

Faculty of Exact Sciences

Lecture 1 in Technical English/ First Year Master Physics

Plasma is a form of matter in which many of the electrons wander around freely among the nuclei of the atoms. Plasma has been called the fourth state of matter, the other three being solid, liquid and gas. Normally, the electrons in a solid, liquid, or gaseous sample of matter stay with the same atomic **nucleus**. Some electrons can move from atom to atom if an **electrical current** flows in a solid or liquid, but the motion occurs as short jumps by individual electrons between adjacent nuclei. In plasma, a significant number of electrons have such high energy **levels** that no nucleus can hold them. An atom that has **lost** some of its electrons, thereby attaining an electric charge, is an ion. When a gas is subjected to heat or an electric field, some of its atoms become **ions**, and the gas is said to be ionized. An **ionized gas**, unlike a gas in its normal condition, can conduct electrical current to a limited extent. If the heat or electric field becomes extreme, many of the atoms become ions. The resulting super-ionized gas is plasma, which can conduct a large and sustained electric current. Over 99% of the matter in **the visible universe** is believed to be plasma. When the atoms in a gas are broken up, the pieces are called electrons and ions. Because they have an electric charge, they are pulled together or pushed apart by **electric fields** and magnetic fields. This makes a plasma act differently than a gas. For example, **magnetic fields** can be used to hold plasma, but not to hold a gas. Plasma is a better conductor of electricity than copper. Plasma is usually very hot, because it takes very high temperatures to break the bonds between electrons and the nuclei of the atoms. Sometimes plasmas can have very high pressure, like in stars. Stars (including the Sun) are mostly made of plasma. Plasmas can also have **very low pressure**, like in outer space. On Earth, lightning makes plasma. Artificial (man-made) uses of plasma include **fluorescent light bulbs**, neon signs, and plasma displays used for television or computer screens, as well as plasma lamps and globes which are a popular children's toy and room decoration. Scientists are experimenting with plasma to make a new kind of **nuclear power**, called fusion, which would be much better and safer than ordinary nuclear power, and would produce much less **radioactive waste**.

Inspired and composed by various sources

Read carefully the text above and answer the questions below:

1- Comprehension of the text:

- Give the title for this text?
- How many paragraphs in the text?
- What is the definition of plasma?
- What is the topic of the text?
- Translate the underline words in the text to Arabic.

2- Complete sentences with the following words: (4pts)

Different color, pressure, 4th state, Scientists, visible universe, plasmas, power, energy.

- Plasma is created by adding _____ to a gas.
- Sometimes _____ can have very high _____, like in stars.
- Plasma is a _____ of matter.
- Each type of gas makes a _____.
- Over 99% of the matter in the _____ is believed to be plasma.
- _____ are experimenting with plasma to make a new kind of _____ nuclear, called fusion.

3- Linguistic competency: (3pts)

- Give the opposite and synonym of the following words:

Important ≠	Separation ≠	Internal ≠
Grow =	Warms =	Supply =

*** Translation: (3pts)**

- Translate in Arabic the below short paragraph from the text:

Scientists are experimenting with plasma to make a new kind of nuclear power, called fusion, which would be much better and safer than ordinary nuclear power, and would produce much less radioactive waste.

4- fill in the gaps with the following words:(5pts)

Conservation of Mass, smaller, Atoms, properties, indestructible

.....cannot is created nor destroyed, and they are.....; they cannot be broken intoparts. This was based on the Law of.....

It was later learned that atoms can break into smaller parts. Atoms of different elements have different mass and.....